

# The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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## Improved Emery-Wheel Machinery.

We publish this week additional engravings of new emery-grinding machinery, the tools shown being built by the Springfield Glue and Emery Wheel Company, of Springfield, Mass. Both illustrations represent automatic knife grinders, Fig. 1 showing as one of the recent improvements a small centrifugal pump, which is attached to each machine and is piped, with a valve to regulate the flow of water on the wheel. The water is taken from a tank located on the floor under the machine, out of the way, and after being used runs into a second tank just under the wheel, where the sediment is deposited, and comparatively clean water overflows from this tank into the tank and pump below, the water thus being used over and over. The tank catching the sediment is easily taken out and emptied. The pump furnishes a large supply of water, prevents heating and drawing the temper, and the grinding, it is said, can be done faster than when ground dry. A folding hood nearly surrounds the wheel and prevents the water flying. It is adjustable to the wearing away of the wheel. Improved collars on the spindle of these machines are made to take wheels with holes in them half the diameter of the wheel, and future wheels for the machine will cost less as a consequence. The loose collar is so arranged that the wheel can be balanced at any time. The machines are strong, well proportioned and thoroughly made, and the working parts are well protected from emery and dust. The worm and worm gear are run in an oil dish to prevent wear. The carriage can be instantly stopped by dropping the worm out of gear without shipping any belts or stopping the wheel, a convenience in putting on and taking off of knives. It has an automatic cross-feed by which both ends of the knife are fed up equally at the same time, and can be adjusted so precisely that it will grind  $\frac{1}{32}$  inch at each traverse of the carriage, and as much more as desired. It will stop feeding and grinding at any point, so that when properly adjusted and set in motion no attendant is required. There is a graduated dial at the end of the knife bar, so that the latter can be quickly set and the knife ground to the same degree or bevel as when previously ground. The knife can be set with edge up or down to grind to or from the edge. Cone pulleys on the feed-shaft regulate the carriage to any desired speed. The emery-wheel is  $26 \times 1\frac{1}{2}$  inches, is hung in a swinging frame easily adjusted by a forward movement to the wearing away of the wheel, and cone pulleys increase the speed correspondingly. Special attachments are furnished on these machines to do a large variety of work.

Fig. 2 shows an automatic knife-grinder with a tub or cup-shaped emery-wheel for grinding flat surfaces of moderate width, and all classes of long knives, such as those used on planing machines, rag cutters, paper-trimming presses, cutter shears, &c. The emery-wheel is 16 inches in diameter,  $3\frac{1}{2}$  inches deep, with a 2-inch rim, and is large for this style of wheel, being equal to one 26 inches in diameter by  $1\frac{1}{2}$  inches thick of the common kind. The grinding is done on the front edge or rim of the wheel, and grinds the work flat, unless the wheel is set quartering, when it grinds concave. It leaves a knife strong and ridged just back of the cutting edge, and is of great advantage where knives are used on hard work, and trouble is experienced in keeping the cutting edge free from nicks. It grinds the same bevel whether the wheel is full size or partially worn out. The emery-wheel in this machine also is made to use water to prevent heating, drawing the temper or expanding the work, and has a hood over the wheel to prevent water flying off. The machine has galvanized pans on the carriage under the knife-bar and one under the wheel. This catches the water used and conducts it into cast-iron tanks located under the machine out of the way. A centrifugal pump, as already described, is attached to one of these tanks, piped so that plenty of water is supplied to the wheel. Seven sizes of these machines are made and can be furnished to do work from 1 inch to 12 feet long. A large wheel can be used on the back end of the spindle for grinding.

As a matter of general interest it may be noted that the company make 55 styles and sizes of emery grinding machinery for all purposes.

**A Russo-Chinese Railway.**—It is proposed by the Russian Government to construct a railway connecting Russia with China, even penetrating to the very capital of the Celestial Empire. Russian engineers have already surveyed the route. Count Ignatieff, Governor-General of Eastern Siberia, and Baron Korf, Governor-General of the Amour region, have been summoned to St. Petersburg in order to assist the Imperial Government in selecting the best line. Russian engineers have projected three lines, the first running from Ekaterinburg via Omsk, Semipalatinsk, Hami, Si-on-fou, Hankow and ending at Shanghai; the second line by way of Ekaterinburg, Omsk, Irkutsk, Tchita, Hylor, Dolon Nor and Peking; the third line, Ekaterinburg, Omsk, Irkutsk, Kinchta, Urgo and Peking. It is stated that the Chinese Government has expressed itself in favor of the Russian enterprise.

## German Basic Bessemer Works.

In our issue of October 14 we summarized some of the data collected by two Swedish engineers, J. N. Danielson and B. Wijkander, for the *Jernkontorets Annaler*. Although gathered a little more than a year ago, the information referring to the basic Bessemer works in Germany contains a good

contain 0.7 silicon, 2.50 phosphorus and 4.87 manganese. It is obtained by smelting 67.2 per cent. of brown iron ore, 32.8 per cent. of puddle cinder, 34 per cent. of limestone and 125 to 140 per cent. of coke, with a temperature of blast of  $290^{\circ}$  to  $320^{\circ}$  Celsius. At both works the basic process was at the time in its earlier stages, so that no further details are given.

At Dortmund and Hoerde there are three converters, and at Gutehoffnungshuette and at the Rheinische Steel Works two converters each. It is stated that at the former works 35 charges weighing 8 to 9 tons each, and at the latter works 22 charges each, are blown. Naturally the number of blows made depends upon the time occupied, which as a rule, inclusive of the after-blow, ranges

phosphorus and when the ingots are small. In order to get over this difficulty and at the same time produce solid ingots, bottom casting is frequently resorted to in the works, the molds being arranged in groups of eight. The scrap occasioned by bottom casting increases the cost of production by about 1 mark per ton. Very little need be added to the description so frequently made during the past few years of the progress of the process. In this district, too, it is held that the sulphur may be removed by continuing blowing after the elimination of the phosphorus, but the waste increases simultaneously, and in order to remove a tendency to red-shortness a greater quantity of ferromanganese must be added, which easily leads to a reduction of the phosphorus from the cinder. For that reason a comparatively large sulphur contents is feared in the pig iron. At Gutehoffnungshuette another reason for this fear is given. It is stated that almost always pig iron high in sulphur is low in manganese, a point easily understood, because sulphur is removed during the process by the same circumstances which aid high manganese in the pig. So far as the status of the basic process as compared with the acid process is concerned it is stated that when the difference in price between acid and basic pig is about 10 marks the cost of the ingots in both processes is about the same. One drawback in connection with the basic process is that it is rarely possible, and then to a limited extent only, to add rail ends or scrap into the converter during the blow.

In consequence of low freights good Bilbao ores have been brought to Amsterdam and Rotterdam at low cost, so that Bessemer pig can be made in Westphalia as low as 48 to 50 marks, while at the same time Thomas pig costs 42 marks. In Eastern France it is estimated that the latter is about 10 francs cheaper than the former when produced from pure Spanish ores. In the Ruhr district the following estimate is made:

Acid.	Marks.
Pig iron, 1,100 kg. at 52 marks.....	57.11
Cost of conversion.....	14.40
Total cost of ingots.....	71.50
Basic.	
Pig iron, 1,165 kg. at 44 marks.....	51.36
Cost of conversion.....	20.00
Total cost of ingots.....	71.36

As stated before, dolomite and tar bricks are now generally used in German works. The following are analyses of dolomite given:

	Hoerde.	Roth.	Erde.	Basel.
Silica.....	2.02	0.60	1.35	
Oxide of iron and alumina.....	2.30	1.16	3.31	
Lime.....	61.31	32.45	30.12	
Magnesia.....	34.42	19.15	19.21	
Carbonic acid.....	46.45	44.45	44.97	
Water.....			1.99	
Total.....	100.05	99.81	99.85	

It is calcined in cupolas, being charged in layers alternating with coke. At Hoerde, where the quality of the fuel is high, the consumption is only 13 per cent. At Hayenge, where a very low quality coke is used, equal parts of fuel and dolomite are necessary. A very strong blast is required for calcining dolomite, because the temperature must be carried to such a point that the dolomite is sintered. At Hoerde the cupola is 6 m. high and furnishes a daily product of 10 tons of calcined dolomite. After being cleaned it is ground and mixed with coal tar. The latter generally contains as much as 20 per cent. of water, and this must be driven off by drying in a cast-iron pan. In spite of this the tar generally contains from 0.2 to 0.5 per cent. of water. For the converters a somewhat more finely ground dolomite is employed than for the bottoms, which are stamped from half fine and half coarse dolomite. Beside this a somewhat larger quantity of tar is used in the mixture for the bottoms. The quantity of tar employed at the different works varies within pretty large limits. In the Westphalia works it is stated to amount to 18 to 20 per cent. At Hayenge and Mont St. Martin the quantity is only 7 to 9 per cent. The lining of each 10-ton converter is 450 to 500 mm. thick, and the thickness of the bottom is 650 mm. The number of tuyeres appears to range within pretty large limits. At Kaiserslautern the 5-ton converters have 40 11-mm. tuyeres. At Oberhausen the 5-ton converters have 45 12-mm. tuyeres. At Hoerde and Dortmund the 10-ton converters have 50 12-mm. tuyeres. At Hayenge the 8-ton converters have 12 blocks with eight tuyeres at 12 mm. At Mont St. Martin 15-ton tuyeres, 21 blocks, with nine tuyeres at 10 mm. At Athis 12-ton converters have 19 blocks, with nine tuyeres at 10 mm. At the Rheinische Steel Works the 7-ton converters have seven blocks, with seven 12-mm. tuyeres. At Phoenix 5-ton converters have 11 blocks, with seven 10-mm. tuyeres. At the works of Brother Stumm the 8-ton converters have eight blocks, with seven tuyeres 12 mm. in diameter. The bottoms are dried in a long chamber which has room for a number of them, and in which during 16 to 18 days they are advanced toward the fireplace until taken out. This arrangement for drying is not, however, considered very satisfactory, partly because the heat cannot be regulated for the different bottoms, and partly because mistakes easily occur; so that in a hurry one may be taken out that has not been in the drying chamber,

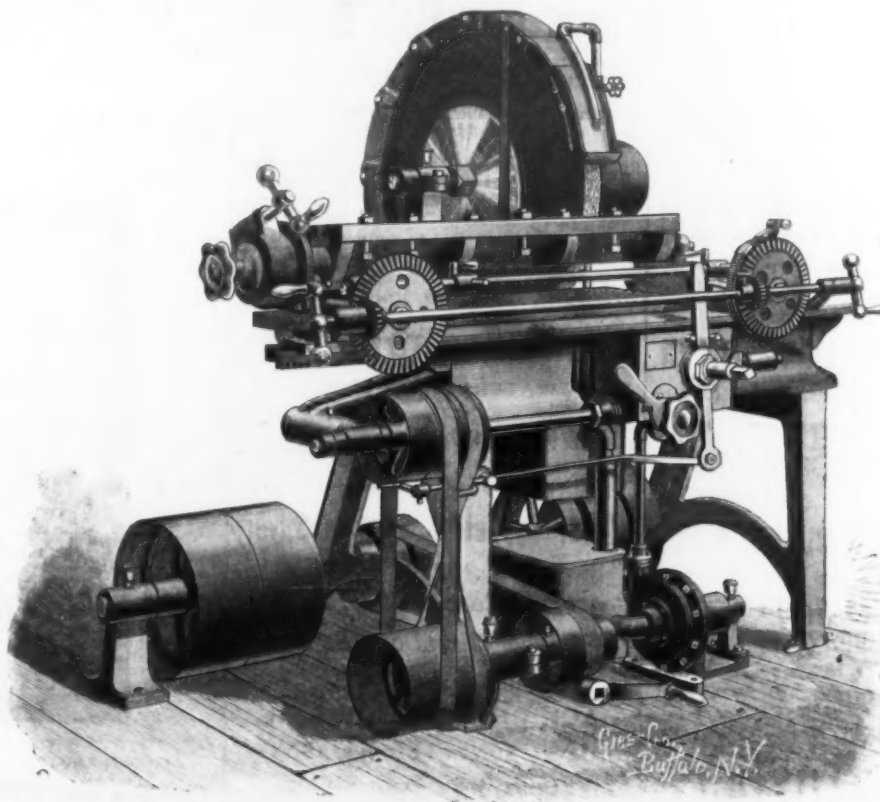


Fig. 1.—Automatic Knife Grinder.

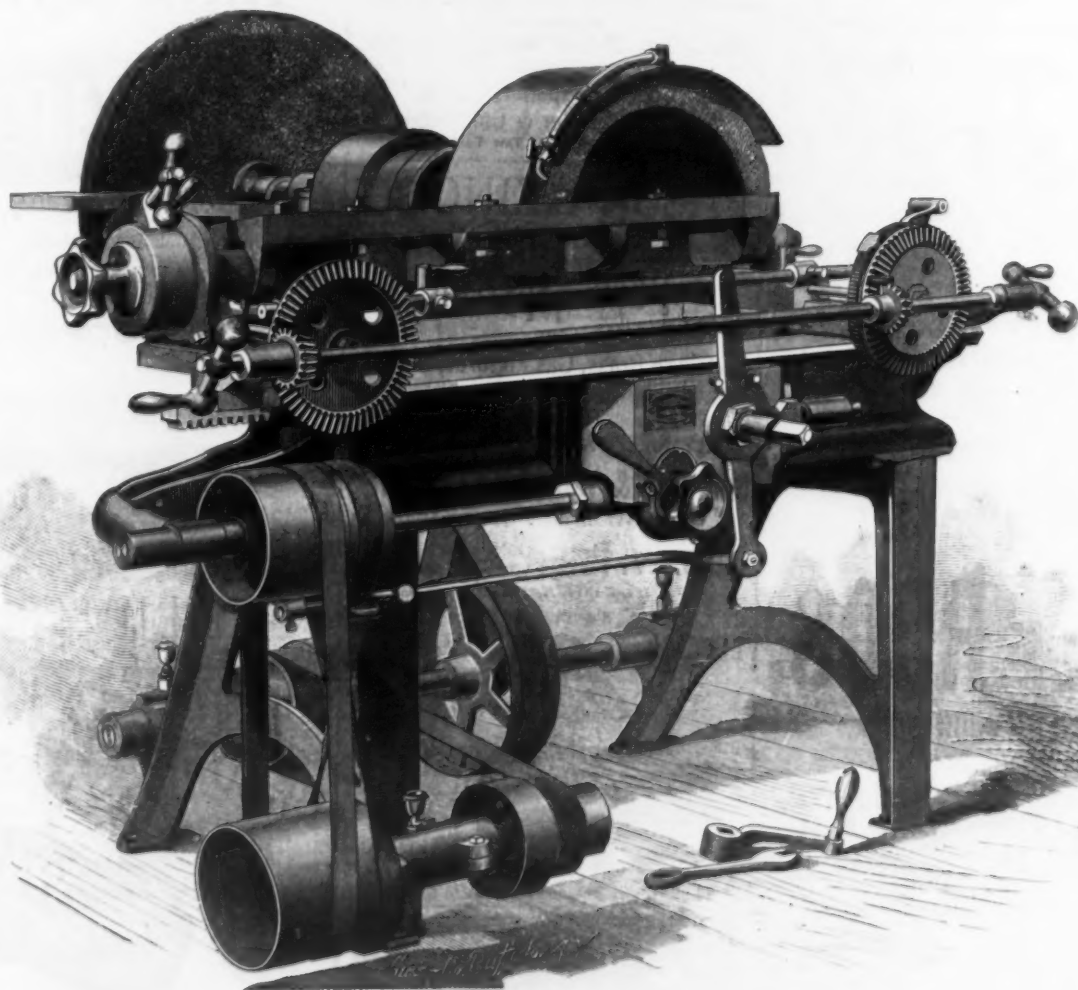


Fig. 2.—Tub Wheel Automatic Knife Grinder.

IMPROVED EMERY-WHEEL MACHINERY, BUILT BY THE SPRINGFIELD GLUE AND EMERY WHEEL COMPANY, SPRINGFIELD, MASS.

many figures which have probably not undergone much change since then. In Upper Silesia the process has been introduced at the Koenigshuette and Friedenshuette. In both works the converters are placed in a line side by side, and the casting ladle is taken by a large steam crane placed on a track in front of the converters to a casting pit in the vicinity. This arrangement is convenient, but it is likely that the running of the crane is connected with heavy cost. At Koenigshuette, as well as at many other works, the metal is not cast directly from the ladle, but into a funnel below it, which is supposed to give greater life to the molds. The basic pig used at these works is said to

In the Rhenish Provinces and in Westphalia, as is well known, the basic process has been most fully developed and has experienced more general introduction than anywhere else. In all the works it was in use with the exception of that of Krupp. The work is not specially intended for the manufacture of goods of high quality, but it is supposed to supplant the acid Bessemer steel in rail manufacture and other purposes. Quite a large proportion of it is used in wire. The pig iron used is said to contain:

	Silicon.	Phosph.	Sulphur.	Manga.
Rheinische S. W....	0.8	3.0	0.07-0.15	1.0
Dortmund Union....	0.8-0.5	2.0-3.0	.....	2.0-3.0
Hoerde.....	0.25	2.5	.....	2.5
Gutehoffnung.....	0.3	3.0	0.1	1.5

from 8 to 22 minutes, but after all the main point in connection with the time required is the loss of time experienced in making repairs which are always connected with this process. The practice, which was formerly general, of employing tar brick for lining the converters is more and more giving way to ramming in the basic lining. While it takes more time it lasts longer. At the Rheinische Works the upper third of the converters is lined with acid material. The production depends, besides, upon the time required for casting, as all basic metal has a tendency to rise. The casting requires a good deal of time, especially in producing very mild steel low in



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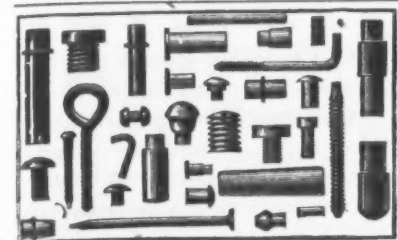
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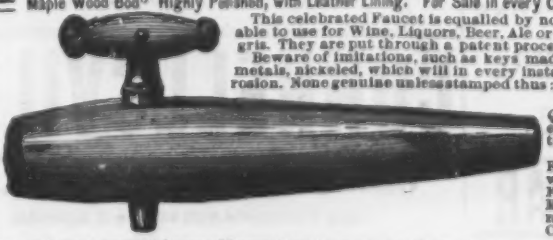
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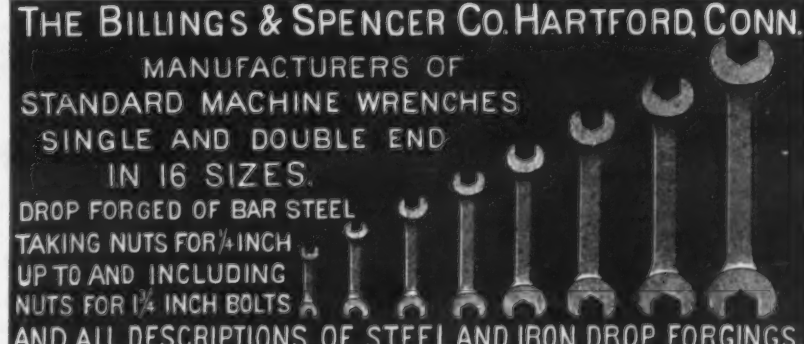
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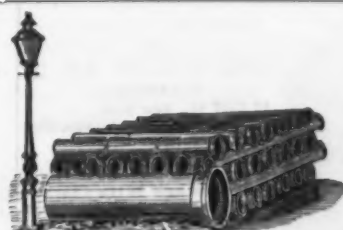
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long enough. In order to overcome this difficulty Hoerde has been making arrangements to dry every bottom in a separate chamber. Converter linings must also be well dried by a gradually increasing coke fire, the temperature being finally raised to the point of sintering the lining to some extent. This requires five to seven hours and about 600 pounds of coke or 24,000 pounds of coal. The bottoms stand as much as 24 blows, and it is claimed even 30 at the Rothe Erde Works. Generally, however, the average is only 15 to 18, and sometimes does not go beyond 9 or 10. The bottoms are always burned, more especially the tuyeres, when made of firebrick. The latter, however, may be easily replaced by tuyeres as much shorter as the bottom has been burned. The lining generally calls for repairs only after 80 to 100 charges, which generally consist in patching up the lower part of the converter. Holley's arrangement for changing bottoms has only been seen at the Athus Works, in Belgium, where it took 45 minutes to change a bottom. It has been introduced also at Mont St. Martin. With the exception of one single works it has been the experience of all that it takes three converters in order to insure a steady output. It was only at Athus that with the help of Holley's arrangement two 12-ton converters were sufficient to carry through a daily product of 400 tons. Other works with only two converters lose daily three to four hours in changing one or two bottoms, and therefore attain only 22 to 24 charges, while with three converters 28 to 30 and even 34 charges may be easily made in 24 hours. Converters which will take a 10-ton charge in the acid process will carry only 8 tons in the basic. In the basic works more recently built the casting pit is arranged at some distance from the converters, in order to allow of more space for the removal of the large quantities of slag produced in this process.

As a rule pig iron containing 1.5 to 3 per cent. of phosphorus and 0.1 to 1.5 per cent. of silicon is used in the basic process. The following are figures at a number of different works:

Phosphorus. Silicon. Manganese.

Neunkirchen..... 2.5 0.5 2.0

Hayange..... 3.2 1.5 1.2

Mont St. Martin..... 2.0 1.5 1.5

Athus..... 2.0 0.8 1.5

Rothe Erde..... 2.0 1.2 1.5

Islede..... 3.0 0.1 2.8

Usually the percentage of phosphorus is not allowed to go above 3 per cent., because the waste and the destruction of the lining increase with higher percentages. The hotter the pig iron is and the higher in phosphorus the lower must be the percentage of silicon. Some manganese is always useful, because it makes the cinder more fluid and generally acts against the high percentage of sulphur which is characteristic of a good deal of the basic pig. Some works whose iron is not high in phosphorus have brought the addition of lime between 12 to 14 per cent., but the majority of them must have between 17 and 20 per cent. In order to avoid cooling the converter too much the lime is generally brought directly from the calcining furnace. The limestone generally is very pure. Some of the French works, in order to make the slag more fluid, add about 1.5 per cent. of fluor spar to the lime.

In consequence of the low percentage of silicon in the pig iron the combustion of the carbon begins very early and continues for nine to ten minutes, then the after-blow follows, during which the phosphorus is slagged. This operation lasts two to four minutes. The majority of the works use for that purpose a certain number of revolutions of the blowing engine. Then the converter is dipped over enough to allow the greater part of the phosphoric slag to flow off. At the same time a sample is taken which is rapidly forged out to a round plate, cooled in water and broken. According to the fracture an estimate is made whether the steel is dephosphorized or whether it will be necessary to continue the after-blow. There is as a rule considerable difficulty in this, because a continuance of the after-blow must be avoided as much as possible, as it seriously affects the maintenance of the bottoms and increases the waste. In consequence thereof there is usually quite a percentage of phosphorus in the product, though it is generally brought below 0.10 per cent.; it is, however, rarely under 0.05 per cent. One works who graded its product according to phosphorus percentage in the year 1884 had 80 per cent., with less than 0.10 per cent. phosphorus, 4.76 with 0.10 per cent. phosphorus, and 15.29 with more than 0.10 per cent. phosphorus. Spiegeleisen is added in order to produce higher carbons. Ferromanganese is used for milder steels. The former is melted in a cupola, the latter is preheated in some works, though the majority add it cold. When the bath boils a good deal it is the practice at a good many works to add 40 to 60 kg. of ferrosilicon containing 10 to 14 per cent. silicon in order to obtain solid steel. At Kaiserslautern large quantities of 5-mm. plates are produced. These possess a tensile strength of 50 to 55 kg. per square millimeter, 18 to 20 per cent. of elongation, and are subject to tests by firing. Plates 300 mm. in diameter must not show any cracks after firing 10 shots from a distance of 50 m. with breech-loading rifles.

Between 15 and 17 per cent. In producing rail steel a smaller amount of lime is added and the after-blow is not quite so long. In consequence thereof the waste is smaller than it is when producing steel requiring a greater purity, so far as phosphorus is concerned. The milder the steel is to be the more expensive and difficult the manufacture becomes, because the metal boils a good deal. In cooling, large volumes of gas escape, which even in careful casting give rise to unsound ingots. The crop ends which are the result of this circumstance increase the cost very considerably.

At Neu Oberhausen there are two basic converters, besides two acid and two reserve vessels. Bottom casting is adopted in the case of basic steel. The charge is red hot, the pig iron running into the vessels very warm. It is stated to contain 2.5 per cent. of phosphorus, 0.5 to 0.7 per cent. of silicon, and 1.5 of manganese. At Neu Oberhausen pig iron with as much as 3 per cent. of phosphorus has been worked, but so much



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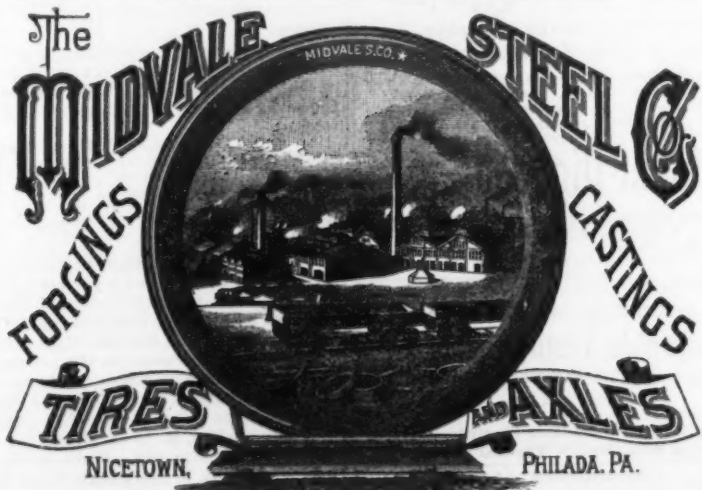
File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

"Iron Center" Cast Plow Steel. | Finished Rolling Plow Coulters, with Patent Screw Hubs.  
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### LOCOMOTIVE AND CAR-WHEEL TIRES

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Quality and efficiency fully guaranteed. Prices as low as any of the same quality. We manufacture Heavy and Light Forgings, Driving and Car Axles, Crank Pins, Piston Rods, &c.

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**STEEL RAILROAD AND MACHINE FORGINGS,**  
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 Special Sizes.

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Iron, Steel or  
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UP TO 18 INCHES THICK.  
 GUARANTEED TO STAND  
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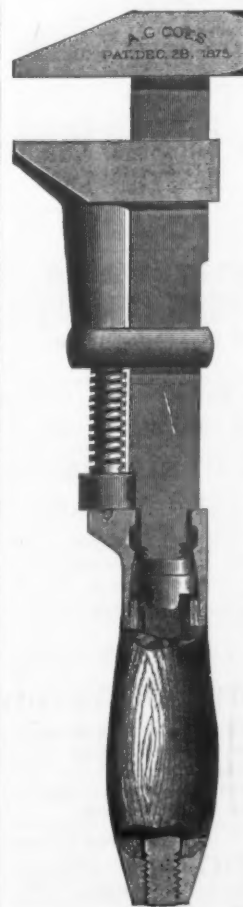
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Established 1661.  
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**STEEL**  
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**A. G. COES' PATENT**

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The Strongest Wrench made, and the only successful re-enforced bar. The Ferrule is firmly secured in place by a nut screwed on the bar.

Particular attention is called to the way in which the handle is made and fastened to the shank.

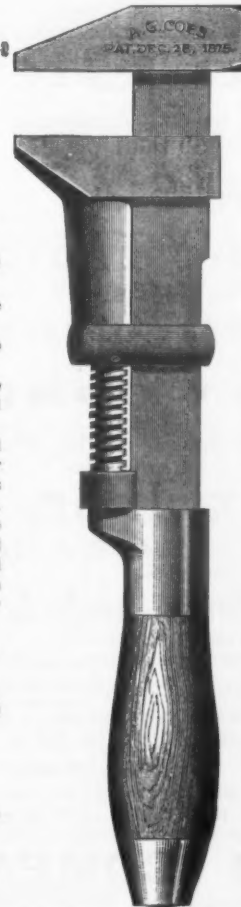
This Handle is made better and stronger than heretofore by using our new Cup Tip at the end which encloses the wood and keeps it from splitting. This is the only wrench which has the wood handle firmly secured and held together at each end, and it will stand more rough usage and last longer than any now made. It is not affected by heat, cold or moisture.

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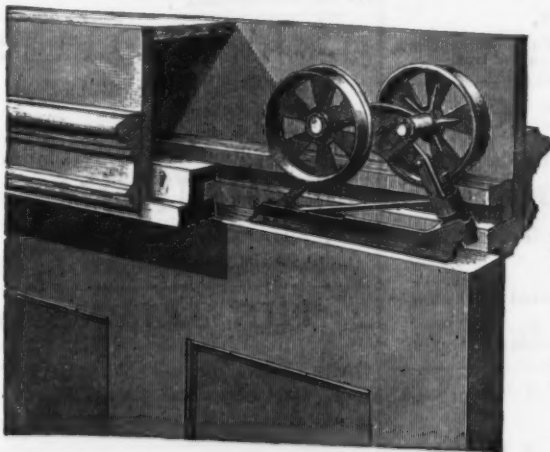
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The only Hanger made that will not bind on an uneven track.

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## Furnace Lamp,

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It has no Seams or Solder in Its Construction.

It is ONE Casting.

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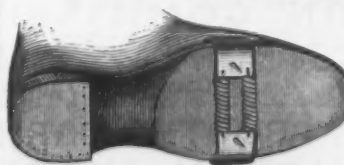
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is just the thing to prevent the feet from slipping. Its action is positive. The feet cannot slip. It is easily put on or taken off, requiring no time in the operation, a single motion placing or removing it from the shoe. The "CHALLENGE" needs no commendation; it has proven its superiority over all others. They are carefully made and of the best material, nickel-plated, and put up in single boxes convenient for the pocket. They are made in six sizes, A and B for women; 1, 2, 3 and 4 for men.

DIEBEL MFG. CO., PHILADELPHIA, PA.

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**COLD ROLLED STEEL**  
**PRESS & DROP WORK**

IN VERY LONG COILS SUITABLE FOR FEEDING AUTOMATIC MACHINES  
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GLASS The most perfect and non-corrosive valve seat, used only in Myers' Pumps.

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Adapted to open and drilled wells. The only double acting force-pumps furnished with expansive plunger bucket and Glass Valve-Seat. The only successful Drill Well Pump made.

Simple, durable, powerful, easy to operate. Never affected by frost.

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A perfect reversible carrier. New Myers' iron, steel and wood track carriers. The simplest carriers made. Double and single harpoon hay forks, pulleys, grapples, sling attachments, grapple hay forks, door and hanging hooks, etc.

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Windmill, Boiler Feed  
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Hydraulic Rams, Iron  
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of every description,  
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U. S. A.MANUFACTURERS OF  
CISTERN, PITCHER, WELL and  
FORCE**PUMPS**  
Wind Mill Pumps, Hand and  
Power Rotary  
Pumps.**HYDRAULIC RAMS,**  
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Write for Catalogue and Prices.

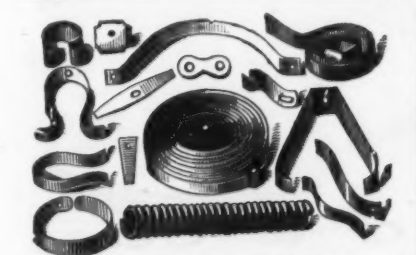
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CAGES.**The cheapest and  
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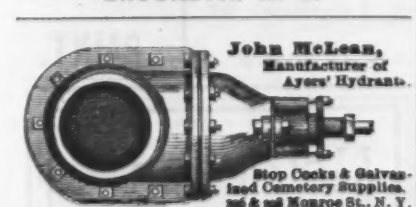
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IMPROVED  
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Blooms guaranteed and especially adapted  
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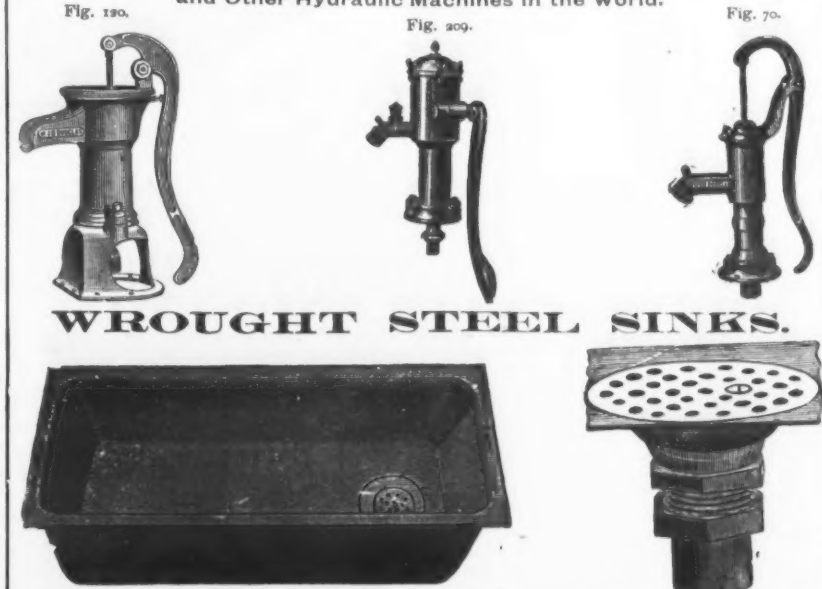
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of Cotton, Linen and Steel.

FOR ALL PURPOSES.  
351 to 353 Nassau Ave., Brooklyn, N. Y.**W. & B. DOUGLAS, Middletown, Conn.,**

The Oldest and Most Extensive Manufacturers of

**Pumps, Hydraulic Rams, Garden Engines,**Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps  
and Other Hydraulic Machines in the World.

One of the strong points of these sinks is the new coupling with which they are now supplied, and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of break-  
age in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by  
most competent judges is evident from the fact that leading houses which have been interested in the con-  
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Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

BRANCH WAREHOUSES:

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**UNION MANUFACTURING CO.****FIG. 114 REPRESENTS OUR  
Hand Force Pump.**It is made of brass, is strong and light, and is the best pump of its kind in the  
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**THE E. & G. BROOKE IRON CO.,**  
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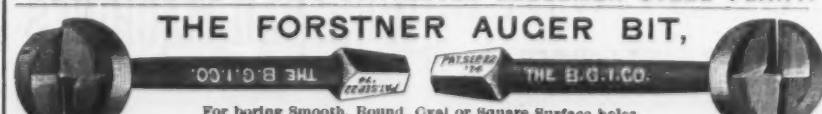
Capacity, 1000 Kegs per Day.

Made from their own Pig Iron, insuring Regularity and Superiority in Quality.

**FOUNDRY AND FORGE PIG IRON,  
AND COLD BLAST CHARCOAL CAR WHEEL IRON.****OLD DOMINION  
CUT NAILS, BAR IRON.****R. E. BLANKENSHIP, President.**

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NOW BUILDING A TWO-CONVERTER BESSEMER STEEL PLANT.

**THE FORSTNER AUGER BIT,**  
SIZES IN EIGHTHS:  
For boring Smooth, Round, Oval or Square Surface holes.  
For fine Carpenters, Cabinet and Pattern work.The BRIDGEPORT GUN IMPLEMENT CO.  
New York Office, 17 Maiden Lane.**L. & I. J. WHITE, MANUFACTURERS OF**  
Coopers', Carpenters' and Ship Tools, Plane Irons,  
Cleavers, &c. Full Line Chisels.

lime must then be added that the quantity of slag becomes unduly large. In blowing 7 1/2 tons of pig iron, 6 1/2 tons of steel are obtained and 1 ton of cinder. The bottoms last 14 to 17 charges, and the lining 50 to 60. Of course in bottom casting a certain amount of scrap is made by the sprues, but the latter are small, and the casting goes on more rapidly than in ordinary top casting. The metal is quiet, but rises a good deal even then, especially in the case of steel running lower than 0.10 per cent. of carbon. A sample of the best basic steel made in Sweden, 0.06 carbon, 0.02 silicon, 0.30 manganese, 0.09 phosphorus and 0.04 sulphur. Such steel, it is stated, was used chiefly for wire, especially when an extra soft quality is desired, and is obtained by adding as rich a ferromanganese as is obtainable. Before adding the latter the slag is drawn off in order to prevent a reduction of phosphorus from the cinder.

Three of the four converters of the Dortmund Union are employed in making basic steel, and occasionally even the fourth is used for the same purpose. The bottoms are said to last 20 blows, and the lining is reported to stand 200 charges. The blow lasts about 15 minutes and the after-blow about five minutes.

At Neunkirchen a new basic steel plant has been built in which only 16 3/4-ton charges are blown during the day shift in two converters. The pig iron is melted down in the cupola, but arrangements are being made to provide for truckwork. It is stated that it contains 2 1/2 to 3 per cent. phosphorus, 0.03 to 0.04 of sulphur and 2 per cent. of manganese. The phosphorus contents of mild steel were reported at 0.04 to 0.05, in rail steel 0.08, and in spring steel not more than 0.1. The greater part of the output of these works is intended for rails, and for this purpose the ingots are cast from above. Quite a considerable part of the output, however, is used for wire, merchant shapes, &c. For that purpose small ingots of 100 mm. square are made which are produced by bottom casting and are rolled in the mill. This has brought about the only peculiarity in the design of the works. Because this casting takes a long time the casting pit had to be enlarged, which was done by adding to the usual circular pit a second straight one, over which the casting ladle is carried on a car.

**Foreign Markets.**

**FRANCE.** Paris, December 10, 1886.—*Metals.*—Although business has been less brisk, prices have remained steady. We quote at the close in francs per 100 kg.: Copper—Chili Bars, 104 @ 106.25; Ingots and Slabs, 111.25; Best Selected, 115, and Pure Corcoran Ore, 107.50. Tin—Banca, 277.25; Billiton, 275.25; Straits, 272.50, and English, 270; Lead, 32.50 @ 33.50, and Spelter, 38.50 @ 39.75. Iron.—We cannot report much of a change for the week. In spite of the efforts made by Northern rolling-mill owners, it is impossible to obtain during the week of business we have entered upon in this city for a month or two probably over 13 francs per 100 kg. for Merchant Iron. In the North-eastern Department Sheet Iron does not bring over 13.50 @ 14 francs at the works. The North-eastern Steel Works Company of France secured an order for 10,000 Rails for railways. Several other adjudications for Bolts, &c., have come off at the North at satisfactory rates, both to the maker and consumer. The prices which Portuguese railroads are ready to pay for cars, both freight and passenger, are extremely low. During the past four years the export price of cars has declined nearly 50%. The business outlook in the iron and steel trades in France is most encouraging, the present dullness being looked upon as temporary and due to the winter season. Coal—has been in better demand in consequence of the cold, seasonable weather, but companies have not succeeded in enhancing the price.—*Moniteur des Interets Materiels.*

**BELGIUM.** BRUSSELS, December 10, 1886.—*Iron.*—Great firmness is the main characteristic of the Belgian iron market, due chiefly to the perfect understanding subsisting among members of our syndicate, nor is the time distant when larger orders will begin to be placed in Belgium, but, as is usually the case, if it is unequally distributed. Some works have booked orders enough to last them for six months. There is a lack of demand for Beams and Thick Sheets; we are aware that they are wanted in British India, but the London commission houses who have received the orders decline to submit to the prices fixed by our syndicate; they do not ship except lots positively wanted without delay. Structural-iron works cannot be said to be very busy, this being the dull season; one of our concerns received orders for a Railroad Bridge in Portugal and another in Holland. At any rate we are bridging over this winter a great deal better than the one of 1886-87. Indications point to an early and lively spring campaign unless something unforeseen should happen on the political checkboard of Europe of a warlike nature. Coal—Is active, but not higher.—*Moniteur Industriel.*

**GERMANY.** HAMBURG, December 10, 1886.—*Iron.*—With the exception of a few specialties in the finished iron line there has been a good, steady demand for everything in Rhemish Westphalia, with a gradually hardening tendency. While production of Pig Iron has been no greater than during previous months, the stock goes on decreasing. Forge Pig is still selling comparatively low in the Siegen district, say, at 40 marks per ton, but the price will soon be raised, there being a very active demand for it. There being a brisk export demand for Spigels, brands with 10 @ 12% manganese fetch 47 marks. Foundry Pig advanced altogether about 2 marks per ton in November. There is not a very striking increase in the demand for Thomas and Bessemer, yet both are firmer. Thomas commands 57 @ 59. The rush to obtain finished iron is such, and makers are so loaded down with orders, that a strong upward tendency has at length been established, and those who want to be served at once have to submit to quite an enhancement of price. There being a greater sale of Steam Boilers, Sheets are looking up. A new syndicate on a better basis is to be formed in the Boiler Sheet branch. Thin Sheets cannot be had for ready delivery below 12 marks per ton. Wire Rods cannot be had any more under 100 marks per ton. Drawn Wire and Wire Nails are not higher yet, but soon will be. From but two quarters some complaint is still heard, viz., machine shops and foundries. It is positively expected that the International Sheet-Rail Syndicate will be reconstituted; two French makers are ready to join the same. Metals—Lead is stagnant and Copper weaker; there is no change in prices.—*Borsen-halle.*

**EAST INDIES.** SINGAPORE, October 25, 1886.—*Tin.*—There have been large supplies, and in sympathy with London the price has declined, but a firmer feeling is apparent at the close. Buyers offer \$36.55, and sellers ask \$38.50. Large supplies and consequently large exports are expected until the Chinese New Year holidays, which occur in the fourth week of January. Tonnage.—For New York the Virginian delta requires cargo to fill up, but there is absolutely nothing obtainable. Rates are nominally unchanged. For Boston the berth is vacant. Exchange is firm at 3/32 for six

months' sight credits. Shipments from the Straits Settlements to the United States during the first nine months, 55,338 piculs, against 53,143 piculs in 1885; 46,225 in 1884; 55,215 in 1883; 88,444 in 1882, and 68,186 in 1881.—*Gillfillan, Wood & Co.*

COLOMBO, CEYLON, November 4, 1886.—*Flum-bago.*—The market has been steady at ensuing quotations in rupees per ton: Large Lump, 125 @ 155; Ordinary do., 125 @ 140; Chips, 75 @ 90, and Dust, 40 @ 60. Export since October 1, 10,414 cwt. to England; 103 to Hamburg, and 35,396 to the United States; together 45,813, against 18,152 in 1885; 17,041 in 1884, and 24,103 in 1883. Exchange, 1/6 1-16 @ 1/16.—*Volkart Brothers.*

**HOLLAND.** ROTTERDAM, December 6, 1886.—*Tin.*—Following are the official statistics for the month of November:

November 30.	1886.	1885.	1884.
Stocks of Banca on warrants with the Nethld. Trad. Co. in Amsterdam.....	19,433	20,928	35,182
in Rotterdam.....	14,365	9,100	10,050
Total.....	33,798	30,028	45,232
Billiton stock at Amsterdam and Rotterdam.....	25,956	20,568	35,050
Total.....	59,754	50,596	80,282
Nov. deliveries of Banca.....	10,994	10,300	7,400
Nov. deliveries of Billiton.....	5,514	8,300	6,732
Total deliveries.....	16,508	18,600	14,132
Banca afloat.....	13,300	1,000	18,000
Stock of Banca awaiting coming sales.....	41,572	70,911	81,959
Billiton afloat.....	25,897	21,290	30,187
Price of Banca.....	fl. 61 1/4	fl. 59 1/4	fl. 49 1/4
Price of Billiton.....	fl. 61 1/4	fl. 59 1/4	fl. 49 1/4

The Government returns for the month of September are as follows:

Export of Tin from Holland.	1886.	1885.	1884.
To Germany.....	4	4	2
England.....	4	4	2
Belgium.....	84	134	110
France.....	22	29	24
Hamburg.....	41	40	24
The United States.....	26	31	23
Other countries.....	45	43	48
Total.....	589	671	534
Nine months.....	1,011	3,039	3,732
To Germany.....	150	456	406
England.....	787	630	704
Belgium.....	235	334	390
France.....	402	469	324
Hamburg.....	235	334	390
The United States.....	235	334	390
Other countries.....	477	341	383
Total.....	6,372	6,567	6,097

Our market has been quiet, but firm, during the week at 61 1/2 fl. Banca; spot Billiton ditto, 61 1/2, and March delivery, 61 1/2.—*Koch & Vatermann.*

**SPAIN.** BILBAO, November 27, 1886.—*Iron Ore.*—There has been a brisk demand for the United States, several steamers having been dispatched for that destination during the week, while others are loading. Prices have been steady at 6 1/4 @ 6 1/2, Campanil, and 6 1/2 @ 6 3/4, Rubios Superiores. At Cardiff a sale was made of 100,000 tons, deliverable next year, at 10 1/2 per ton, cost, freight and insurance. A firm in Wales has made charters for next year to the amount of 50,000 tons at 5 1/2. Total shipments so far, 2,871,052 tons, against 2,062,660 last year. Pig Iron.—There has been a good domestic and export demand. Export so far this year, 45,544 tons; coastwise shipments, 37,970 making a total of 83,514 tons.—*Bilbao Maritime y Comercial.*

**AUSTRIA.** VIENNA, December 6, 1886.—*Iron.*—The Austro-Hungarian iron markets are favorably situated for the formation of syndicates continues, the latest being one of Axle manufacturers in Austria proper, and of Foundry Pig-iron producers in Hungary. Large dealings are reported in Pig Iron and Sheets. The market exhibits great firmness at the close. We quote in florins per ton: Pig Iron, 40 @ 49; Merchant, 98 @ 122.50; Sheets, 140 @ 175, and Beams, 105 @ 110. Metals have been steadier; we quote per 100 kg.: Copper, 55 @ 59; Lead, 18.50; Spelter, 18.25; Tin, 130.50; Antimony, 36, and Quicksilver, 220.—*Austrian Trade Journal.*

**Ownership of United States Bonds.**

The report of the register for the last fiscal year to July 1 answers a question often asked regarding the location of outstanding United States bonds. The impression is quite general that a considerable amount is held abroad, but the report shows that the foreign ownership of the several issues at the close of the last fiscal year were as follows:

3 per cents in foreign countries.....	\$17,150
4 per cents in foreign countries.....	7,821,580
4 1/2 per cents in foreign countries.....	3,849,150

Total.....\$11,988,100

The holdings by national banks on that date were as follows:

3 per cents by national banks.....	\$110,553,750
4 per cents by national banks.....	123,065,850
4 1/2 per cents by national banks.....	55,374,000
Pacific Railroad by national banks.....	3,572,000

Total.....\$292,565,600

The amounts held by insurance companies, savings and other banks and individuals were as follows:

Insurance companies.....	\$61,507,000
Savings banks, trust institutions, &c.....	178,357,000
Individuals, trustees, &c.....	469,846,792

Total.....\$1,011,222,092

The class of bonds held by these institutions, individuals and trustees were:

3 per cents.....	\$25,486,150
4 per cents.....	578,098,700
4 1/2 per cents.....	141,721,400
Pacific Railroad 6 per cents.....	61,044,512

Total.....\$796,350,762

The total amount of each class outstanding at that date were as follows:

3 per cents.....	\$136,057,050
4 per cents.....	602,016,350
4 1/2 per cents.....	240,725,150
Pacific Railroad.....	64,022,512

Total.....\$1,011,222,092

Since the close of the year \$2,000,000 of 3 per cents have been called for redemption, leaving uncalled and available for the sinking fund only \$74,057,050.

W. J. Morrow, president of the National Association of Spring and Axle Workers, has issued a secret circular to the members, who number 2500, calling a general convention to be held in Pittsburgh on January 4, 1887. Its object will be to unite all spring and axle makers and those engaged in the different branches of the spring work (railroad, wagon and spiral) in one united body for the defense and protection of their interests against all encroachments. All members of the trade are urged to join the Knights of Labor, and all spring and axle shops are urged to send delegates, whether Knights of Labor or not.



Paris, 1878.



**McCAFFREY & BRO.,**  
PENNSYLVANIA FILE WORKS,  
Philadelphia, Pa., U. S.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

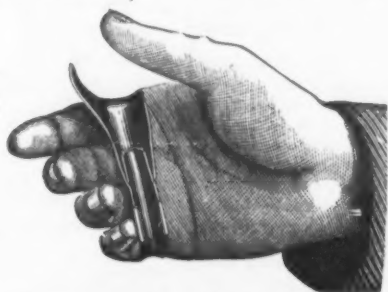
Superiority acknowledged wherever used, sold or exhibited.

## UNIVERSAL CORN HUSKER

[A. W. BRINKERHOFF'S PATENT.]

ADJUSTABLE TO FIT ANY HAND.

Made for Either  
Right or Left  
Hand.



Can be Worn  
over  
Glove or Mitten.

Will not make the Hands Sore! Made Entirely of Brass, without  
Straps, Web or Elastic Band.

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WEYMOUTH'S PATENT.

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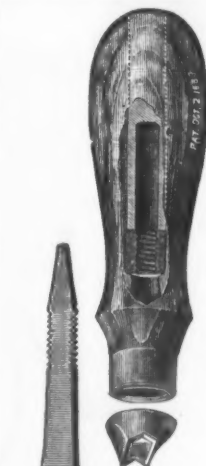
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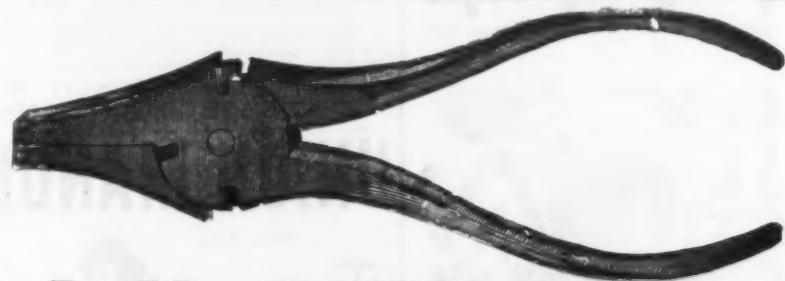
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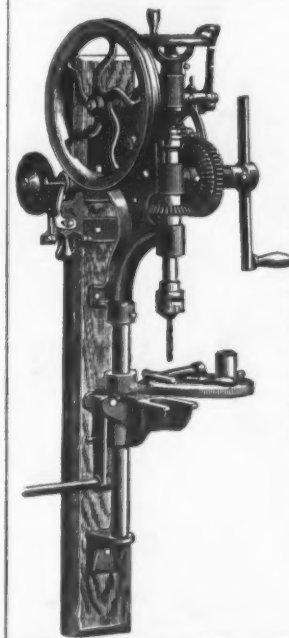
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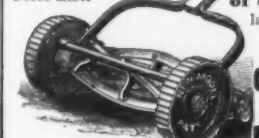


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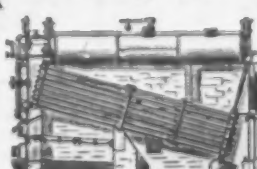
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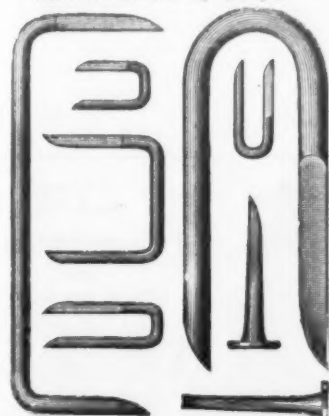
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of Best Quality and Finish.

Prices on Application.

## THE WEEK.

The steamship Herman Winter, just launched by Wm. Cramp's Sons for the Metropolitan Steamship Company, to carry freight between New York and Boston, is an exact duplicate of the H. F. Dimmick, built two years ago. She is 278.5 feet between perpendiculars; has a right-angle connecting compound engine with 36 and 68 inch cylinders, 54-inch stroke. She is a three deck vessel. The sails and all other parts so far as practicable are worked by steam.

The New Haven and Hartford Railroad follow the example of the Pennsylvania Railroad in reducing fares to localities in the vicinity of New York. Five-cent fares on the city elevated railroads, by cheapening conveyance to the suburbs, introduced this change. To the hard-working man and toilers of every class cheap fares mean a way of escape from the overcrowded tenement, and are an unspeakable boon.

It is reported that District Assembly 49 will withdraw from the Central Labor Union, leaving only trades union organizations represented in that body. The separation is said to be caused by mutual aggressiveness, or, as alleged, the attempt of certain trade unions "to run everything their way."

The Cable Railroad Company, who sought to obtain the franchises for 70 miles of railroad in this city, are virtually wiped from existence by a decision of the Court of Appeals refusing their application.

The Electrical Subway Commission of Brooklyn report that the total length of underground conduit finished during the year is 366,000 feet, the maximum capacity of which is estimated at 7400 miles of wire. Already 1121 miles of wire have been drawn into the subway, and a little more than 82 miles of aerial conductors have been taken down.

During the present year 2320 buildings, valued at \$12,000,000, have been added to the real property in Brooklyn. Valuations have nearly doubled in 17 years.

The Union Iron Works, at San Francisco, in addition to the new Government cruiser, have secured a contract for a steel screw steamer of 1000 tons for the Canadian Pacific Navigation Company, to ply between that city and Port Moody. The steamer will cost \$200,000.

The sugar imports at San Francisco in 1886 will amount to 220,000,000 pounds in round numbers, or about 40,000,000 pounds more than last year. The imports from Hawaii increased about one-third.

The Third Avenue Railroad Company have resolved to adopt the cable system on their line, and to commence work in the spring. The change will cost \$1,500,000.

The large sawmill at Evansville, Ind., owned by Chas. Hofferberth, of New York, was wrecked by the simultaneous explosion of three boilers. One man was killed and eight were wounded.

A railroad bridge to cost \$1,000,000 will be erected at the Sault, on St. Mary's River, as soon as the plans are approved at Washington.

The law limiting the height of buildings in New York City, passed by the Legislature about a year ago, proves to be a dead letter. There is no provision for its enforcement nor penalty for its violation.

To prevent excesses of possible labor organizations among the negroes, ostensibly to protect the farmers, the Senate of South Carolina has passed a bill by a large majority declaring that "it shall be deemed a conspiracy and shall be a misdemeanor for any persons united, organized, associated or banded together to interfere by threats, force or in any other way with any contract between any employer or employee."

The city of Memphis contemplates the construction of a new water works at a cost of \$1,000,000.

The new French steamer La Bourgoyne was detained 41 hours on her trip to New York by the breaking of the valve guard to the air pump of the condenser. The "racing" of the propeller in a rough sea caused it.

Major Nathaniel F. Hurd, who was an officer in the war of 1812, died at his home in Montclair, N. J., on the 15th inst. He was active in introducing the hot-blast oven among iron manufacturers in this country. Recently he celebrated his 95th birthday by visiting the iron fields of Ohio unattended.

The art treasures of the late A. T. Stewart, the merchant prince, share the fate of the Morgan collection, which had been gathered in the course of successful enterprise in mercantile life. Nothing could better illustrate the vicissitudes of the business man in America.

Notice comes from Collector Magone that shippers of full cargoes will be allowed until 2 o'clock p. m. of the next day after completion of loading, Sundays and legal holidays excepted, to clear their cargoes at the Custom House and prepare necessary shipping documents.

Several New York capitalists, prominent among whom is John R. Bartlett, are said to have secured large tracts of land in the water-shed forming the sources from whence Newark and Paterson must derive their future supplies of water, with the intention of building extensive reservoirs. At the same time the North Jersey Water Company offer manufacturers and others water from the Pequannock River, as do the West Milford Water Company, and an interesting contest in the courts is likely to ensue. The company last named propose to erect pumps of great capacity and fill a reservoir at Great Notch, on the Orange Mountain, from which the water will flow by gravity to any portion of the contemplated area through wrought steel conduits. The company are now endeavoring to make contracts to supply water to all the cities and towns within their reach.

Steamers will be chartered instead of bought, as originally intended, for the new line between New Orleans and Brazil, until it shall be ascertained how much profit there is in the trade.

Work on the caissons for the bridge across the Hudson at Poughkeepsie is being pushed with vigor.

The Paris Temps says the Hova Government in Madagascar has transferred its contract for a loan from an English company to the Comptoir de Escompte, giving as security the customs receipts at six ports in Madagascar. The amount is \$3,000,000, of which \$2,000,000 goes toward paying the French war indemnity.

The Pennsylvania Railroad Company's pier on the Delaware River, overloaded with merchandise from the steamer Lord Clive, suddenly sunk on Monday, causing a general wreck. Among the freight which went down were \$50,000 worth of indigo, a heavy consignment of silks to Chicago, 1200 bales of wool, worth \$48,000, and 400 boxes of tin plate. Recent engineering operations have altered very materially the sweep and direction of the current in front of the city, and it would be interesting to know if the disaster was related to these changes.

The chief of the Army Ordnance Department has reported favorably on the proposition of William P. Hunt, of the South Boston Iron Works, to construct a number of mortars of the largest size for the Government. He recommends that the manufacture of 40 of them be authorized, at an estimated cost of \$300,000. The matter has been sent to the House Committee on Appropriations.

A cable message says the Lloyds have ordered a steamer to be built which it is intended shall surpass in speed and size any vessel now afloat. She will be constructed by the Fairfield Company, of Glasgow.

Arthur J. McQuade, the "boodle" alderman, who accepted a bribe for his vote on the Broadway Railroad franchise, was sentenced to seven years in the State prison and a fine of \$5000. Ex-Alderman Jaehns, who added perjury to a like offense, received the full limit of the law, 10 years.

Fifty-four leading manufacturers of Buffalo petition for a modification of the contract with the Natural Gas Company, so that they may be permitted to negotiate for special terms instead of paying the uniform rate charged all consumers.

No vestige remains of the great strike at the Chicago stockyards. Ten hours a day is the rule.

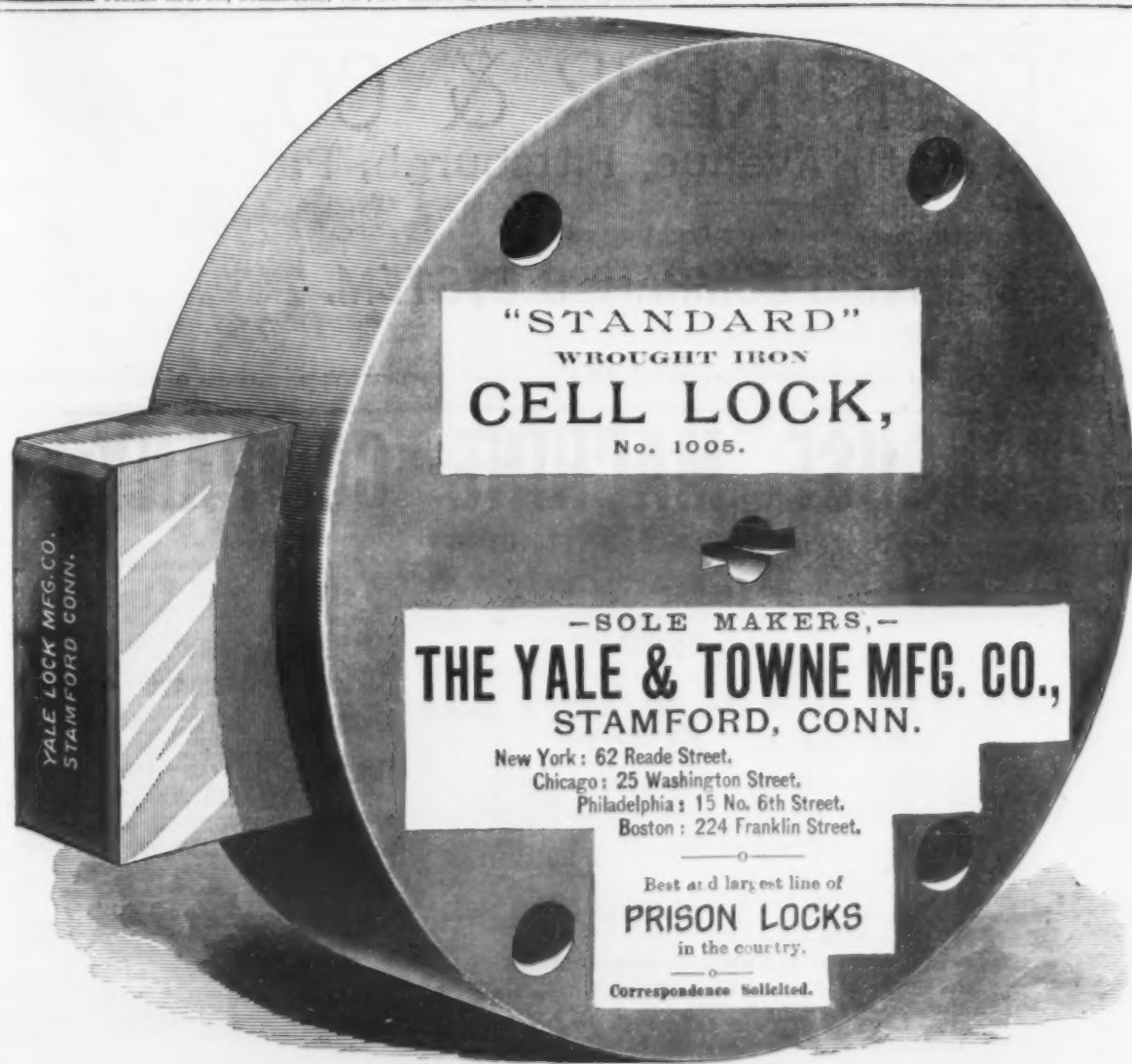
The United States Treasury Department attaches little importance to alleged undervaluations of cutlery in the interest of New York mercantile houses. A leading official says he has found nothing that can be made a basis of action, the charges made being supported by insufficient evidence.

When the elevated railroads were first united under one management 140,000 tons of coal a year were burned for running and heating purposes. As travel on the lines increased more coal was burned, and last year the amount was 150,000 tons. In speaking of the matter a few days ago Manager Hain said that 10,000 tons more would have to be added to these figures for the present year.

A London dispatch says Washington E. Conner, the Wall street broker, was unable to make a satisfactory contract in England for his proposed steel yacht, and will have her built in the United States. Pearce & Elder, of Glasgow, could promise him only 14 knots an hour with the plans submitted.

By a new treaty between Turkey and the United States, now made public, all differences between the two countries are adjusted, and the United States secures substantial advantages as compared with other treaty powers.

Apprehension is expressed that the advance in east-bound freight rates, which took effect on Monday, will operate to divert business from the old routes to Southern ports. To avoid the advanced charge, the Chicago Tribune says "it is rumored that contracts are now pending for the carrying of large quantities of wheat from the Northwest by rail as far South as may be necessary to strike a sufficient depth of water in the Mississippi and thence by boat to New





# H. D. SMITH & CO.,

Plantsville, Conn.,

MANUFACTURERS OF THE

## BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forged Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

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GUILFORD, CONN.

Manufacturers of the "Always Handy" Stove Shelves.

No Stove complete without one. A necessity to every housekeeper. The Castings are of light weight and are nicely finished. They present no cumbersome appearance but are substantial enough to hold the heaviest articles that one might wish to place upon them. The shelves can be turned back independently of each other when not in use, and can be raised or lowered to a desired height.



They are clamped firmly to the pipe by Russia iron bands, the ends being drawn together by strong couplings, and admit of the easy adjustment to various sizes.

Furnished with double set of shelves, as shown in the cut, or single set.

Ten thousand sets sold in one season.

Fine Iron and Brass Castings a specialty.

Write for Prices and Discounts.

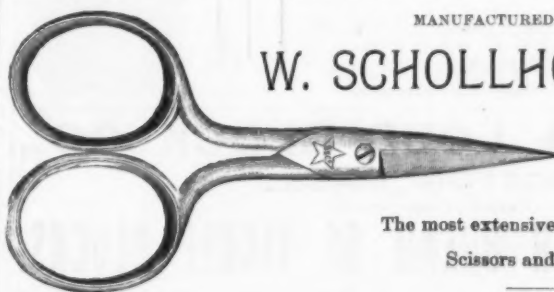
### The Star Scissors and Shears,

MANUFACTURED BY

W. SCHOLLHORN & CO.,

New Haven,

Conn.



The most extensive makers of strictly first-class Scissors and Shears in America.

Complete line of Ladies', Embroidery, Pocket, Buttonhole and Editors' Scissors, Tailors' Points, Straight and Bent Trimmers, Barbers', Bankers' and Paper Shears.

We produce only the very best in quality and finish.

### CURTIS

Pressure Regulator,

FOR

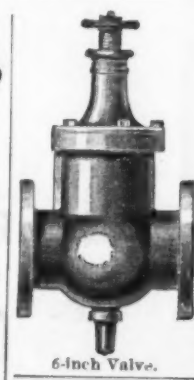
STEAM and WATER

is made entirely of metal; occupies the same space as a globe valve. It has no glands or packing, and is a lock-up valve. Write for circular. Manufactured by

Curtis Regulator Co.,

61 Beverly St., Boston, Mass.

General Agencies: 100 Liberty St., New York; 66 No. 4th St., Philadelphia, Pa.; 108 Fifth Ave., Chicago; 210 So. Third St., Minneapolis; 707 Market St., St. Louis.



6-Inch Valve.

### VARIETY METAL BOOM.

Iron Foundry and Machine Shop.

STEAM HEATING BY DIRECT RADIATION in all its Branches a Specialty. Brass and other Metal Moulding, Casting and Finishing. Noiseless Vertical Engines, Hydrants, Fire Plugs, &c.

FRAS. B. BANNAN,

Pottsville, Schuylkill Co., Pa.

## THE WESTINGHOUSE ELECTRIC COMPANY,

Manufacturers of ISOLATED INCANDESCENT PLANTS, AND CONTRACTORS FOR CENTRAL STATIONS.

It is believed that the advantages of our system place us beyond competition.

Capital investing for dividends will do well to close no contracts till our proposals are considered.

The WESTINGHOUSE ELECTRIC COMPANY, Pittsburgh, Pa.

WESTINGHOUSE, CHURCH, KERR & CO.,

17 Cortlandt Street, New York, 98 Fourth Avenue, Pittsburgh, Pa.



16 C. P. LAMP (half-size).

Engineers and Contractors for Central Stations for Incandescent Lighting on the

### WESTINGHOUSE ELECTRIC COMPANY'S SYSTEM.

Isolated Incandescent Plants, Steam Power Plants for Manufacturers,

Direct-Connected Centrifugal Pumping Machinery, Designers of Special Applications of Steam Power.

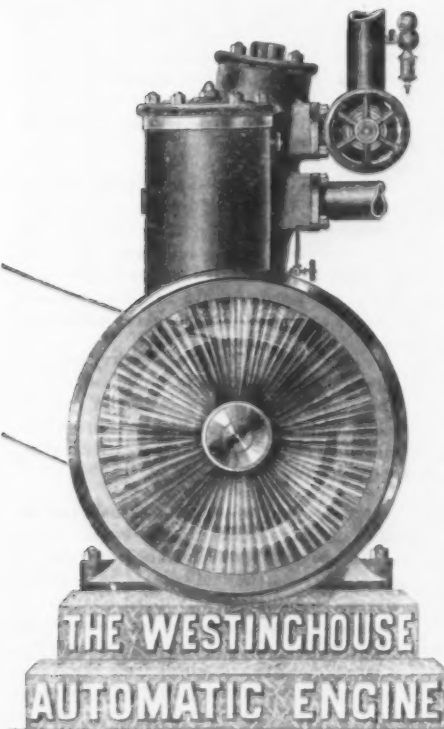
## THE WESTINGHOUSE MACHINE COMPANY.

SALES LIST FOR NOVEMBER, 1886:

South Side E. L. Co.	150	Pittsburgh, Pa.	H. P.	A. J. Mullen	Selma, Ala.	H. P.
Union Switch and Signal Co.	2d order,	"	150	Brainerd & Shepard	Albany, N. Y.	25
East End E. L. Co.	4th order,	"	75	Henry Warden	Philadelphia, Pa.	25
Brush Electric Light Co.	3d order,	"	75	Crown Mills	Marcellus, N. Y.	25
McConway & Torley	3d order,	"	75	S. R. Cain	Bristol, Vt.	25
Winona Paper Co.	3d order,	"	75	Wabash, St. L. and Pacific R. R.	St. Louis, Mo.	25
New York and Manhattan R. E. Co.	4th order,	"	75	Minneapolis Gas Light Co.	Minneapolis, Minn.	25
Mather Electric Co.	4th order,	"	75	Thos. Henhall	Patterson, N. J.	25
Jefferson City E. L. Co.	2d order,	"	75	E. Balbach & Son	Newark, N. J.	75
Wabash E. L. Co.	2d order,	"	75	Gas Engine and Power Co.	New York	15
J. C. Livingston & Co.	2d order,	"	75	Rouleaux, Dagore & Co.	Suresnes, France	15
Weldman Silk Dyeing Co.	2d order,	"	75	Shinkle, Harrison & Howard	St. Louis, Mo.	15
Muller, Brouly & Co.	2d order,	"	75	McCord, Ford & Co.	Colfax, W. T.	15
E. L. McLain Mfg. Co.	2d order,	"	75	Decatur Furace Co.	Decatur, Ala.	15
Van Deventer & Horne	2d order,	"	75	Lawrence Machine Shop	Lawrence, Mass.	15
"The Public Ledger"	2d order,	"	75	N. W. Walt, Son & Co.	Sandy Hill, N. Y.	10
F. Balbach & Son	2d order,	"	75	F. S. Cole	Grandy City, Iowa	10
Wolff & Hamaker	2d order,	"	75	Union Pacific R. R.	Omaha, Neb.	10
Imperial Guano Co.	2d order,	"	75	Geo. C. Howard	Philadelphia, Pa.	5
Chandler & Price	2d order,	"	75	Merritt W. Burwell	New Haven, Ct.	5
Wabash, St. L. and Pacific R. R.	2d order,	"	75	Westinghouse Electric Co.	Pittsburgh, Pa.	5
Barnes Bros.	2d order,	"	75	Lawrence Machine Shop	Lawrence, Mass.	5
				J. A. Diamond	Indianapolis, Ind.	5
				F. J. Yandle	Santa Rosa, Cal.	5
				Aberdeen Packing Co.	Astoria, Ores.	5

TOTAL, 50 ENGINES.

1,975



WESTINGHOUSE, CHURCH, KERR & CO.,  
17 Cortlandt St., New York; 98 Fourth Ave.,  
Pittsburgh, Pa.  
FAIRBANKS, MORSE & CO., Chicago, Ill.

SALES DEPARTMENT FOR THE UNITED STATES CONDUCTED BY

FAIRBANKS & CO., St. Louis, Mo.  
PARKE & LACY, San Francisco, Cal.  
PARKE, LACY & CO., Salt Lake, Utah.  
D. A. TOMPKINS & CO., Charlotte, N. C.

ROBERT MIDDLETON, Mobile, Ala.  
H. DUDLEY COLEMAN, New Orleans, La.  
KEATING IMPLEMENT AND MACHINE CO., Dallas, Texas.



**TEAL'S**  
Portable Hoist,  
Patented, April 8, 1884.  
Advantages claimed.

- 1st. Being made with Spur-Gears and at the same time sustaining the load at any point.
- 2d. One man of ordinary strength is capable of raising the load for which each hoist is built.
- 3d. The ability of rapidly raising or lowering the empty hook by pulling on the lift-chain, instead of the slow and tedious process by the hand chain.
- 4th. Being provided with self-oiling is always lubricated, which adds both to the ease of lifting and the life of the hoist.

TEAL HOIST COMPANY  
(Limited,) 146 Broad St.  
(South from 228 Race) Philadelphia.

**N. Y. MALLET and HANDLE WORKS**

Manufacturers of  
Calkers', Carpen-  
ters', Stone Cut-  
ters', Tin, Cop-  
per and Boiler  
Makers'

Hawsing Beeties,  
Hawsing and Calking  
Irons; also all kinds  
of Handles, Sledge,  
Chisel and Hammer  
Handles. Also  
Cotton and Bale Hooks.

Patented Feb. 23,  
1877, a new combina-  
tion of Hooks.

**Mallets,**

456 E. Houston St., New York City.  
**E. PHILLIPS & SONS,**  
MANUFACTURERS,  
South Hanover, Mass.

**TACKS.**  
**F. R. EMMONS & BRO.**  
21 WARREN STREET,  
New York.

**P. W. Gallaudet**  
& Co.  
Cor. Broadway and Wall St., New York.  
Bankers and dealers in COMMERCIAL PAPER.  
Stocks and Bonds dealt in for cash or on margin at  
New York Stock Exchange.

**MACHINISTS' SCALES.**  
PATENT END GRADUATION.  
Liberal Discount to the Trade. Send for List.

**COFFIN & LEIGHTON, Syracuse, N. Y.**  
**THE BOLTON STEEL CO.,**  
CANTON, OHIO,  
MANUFACTURERS OF BEST REFINED

**TOOL STEEL**  
And Other Fine Grades of  
**CAST STEEL.**

**SEBASTIAN, MAY & CO'S**  
Improved Screw Cutting  
**LATHES** Foot & Power  
Drill Presses, Chucks, Drills,  
Dogs, and machinists' and am-  
ateurs' outfits. Lathes on trial.  
Catalogues mailed on application  
179 W. 2d St., Cincinnati, O.

**COBB & DREW,**  
PLYMOUTH, MASS.

Manufacturers of Copper, Brass and Iron Rivets;  
Common and Swedes Iron Leathered, Carpet, Lace  
and Gimp Tacks; Finishing, Hungarian, Trunk  
Clout and Cigar Box Nails, &c. Rivets made to  
order.

**GRUNDY & DISOSWAY,**  
HARDWARE,  
165 GREENWICH STREET.  
Agents for the Philadelphia Star Carriage and Tire Bolts.

**Cline's Foot Heaters and Fuel,**  
Patented  
U. S.,  
Nov. 10, '85,  
June 10, '86,  
Canada,  
March 21, '86,  
England,  
April 10, '86.  
CLINE MFG. CO., 42 and 44 W. Monroe Street, Chicago.  
Send for descriptive circular with prices.

**THE HATCH BROTHERS CO.,**  
BRIDGEPORT, CONN.,  
MANUFACTURE

Patented Novelties,  
FINE POCKET CUTLERY, SPECIAL TOOLS OR  
MACHINERY, LIGHT HARDWARE, &c.  
Blades for Special Purposes Made to Order.

**Samuel Martin,**  
MANUFACTURER OF  
**Theatrical Hardware,**  
197 Eighth Avenue, New York.

**NEW YORK BELTING & PACKING CO.**  
WAREHOUSE: 15 PARK ROW, NEW YORK.  
THE OLDEST AND LARGEST MANUFACTURERS IN THE UNITED STATES OF

**VULCANIZED RUBBER IN EVERY FORM ADAPTED TO MECHANICAL PURPOSES**

**MACHINE BELTING**  
WITH SMOOTH METALLIC RUBBER SURFACE.  
THIS COMPANY HAS MANUFACTURED THE LARGEST BELTS MADE IN THE WORLD FOR THE PRINCIPAL ELEVATORS AT CHICAGO, BUFFALO AND NEW YORK.

**STEAM AND WATER HOSE.**  
RUBBER TEST HOSE.  
COTTON "CABLE" HOSE, CIRCULAR WOVEN, SEAMLESS, ANTISEPTIC FOR THE USE OF STEAM AND HAND FIRE ENGINES, FORCE PUMPS, MILLS, FACTORIES, STEAMERS AND BREWERS.

**CAR SPRINGS** OF A SUPERIOR QUALITY  
Original Solid Vulcanite Emery Wheels.

**PATENT ELASTIC RUBBER BACK SQUARE PACKING.**  
BEST IN THE WORLD.  
FOR PACKING THE PISTON RODS AND VALVE STEMS OF STEAM ENGINES AND PUMPS.

**CORRUGATED RUBBER MATS AND MATTING.**  
FOR HALLS, FLOORING, STONE AND IRON STAIRWAYS, ETC.

**JOHN H. CHEEVER, TREASURER.**

BRANCHES: { 308 Chestnut St., Phila. } **GOULDS & AUSTIN,**  
{ 52 Summer St., Boston. } 167 Lake Street, Chicago.

**The Cameron STEAM PUMP**  
IS THE  
Standard of Excellence  
AT HOME and ABROAD.  
THE  
**A. S. CAMERON,**  
Steam Pump Works,  
Foot of East 23d St., New York.

**H. A. ROGERS, 19 John St., N. Y.**  
**RAILWAY**  
**AND MACHINISTS' SUPPLIES.**  
EVERY REQUISITE IN THE LINE.  
**TANITE EMERY WHEELS.**  
SOLE U. S. AGENT FOR MONCRIEF'S SCOTCH GAUGE GLASSES.

**BUCK BROTHERS, MILLBURY, MASS.**  
The Most Complete Assortment in the U. S. of  
**Shank, Socket Firmer and Socket Framing Chisels.**  
**PLANE IRONS.**  
CAUTION.—Buyers should be on their guard and not have inferior goods passed on them by unprincipled persons who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also, "Riverline Works."

**VARIETY IRON WORKS.** **ALFRED C. REX & CO.**  
MAIN OFFICE AND FACTORY,  
FRANKFORD, PHILADELPHIA.  
BRANCH OFFICES,  
PHILADELPHIA, 413 Commerce St.  
NEW YORK, 104 Chambers St.  
CHICAGO, 89 Lake St.  
SAN FRANCISCO, 109 California St.

MANUFACTURERS OF  
**Hardware Specialties**  
AND  
**Novelties in Iron, Brass and Bronze.**  
Special attention paid to Electro-  
plating in all its branches.

**H. & J. W. KING,**  
**TABLE KNIFE POLISHING MACHINES**  
**CUHL & HARBECK'S PATENT.**  
These famous Polishers are the best and cheapest  
for cleaning, polishing and sharpening  
Table Cutlery.

**THE**  
**Francis T. Witte Hardware Co.,**  
Sole Agents for United States and Canada,  
106 Chambers Street, New York.

**UNION FOUNDRY AND PULLMAN CAR WHEEL WORKS,**  
**GEORGE M. PULLMAN, President.**  
CORRESPONDENCE SOLICITED AND ESTIMATES MADE ON  
**HEAVY MACHINERY, AND ALL SIZES OF FLY WHEELS, PULLEYS, &c.**  
Special Machinery for Grain Elevators, Grain Steam Shovels, &c., contracted for. Car Wheels and Car Castings at lowest rates.  
604 Pullman Building, Chicago.

Orleans, whence it will be shipped to Liver-  
pool or London at a rate of 5½d., as against  
4d. from New York." The same paper says  
the fact that the Chesapeake and Ohio have  
recently contracted to carry grain from Chi-  
cago to Newport News at 20 cents per 100  
pounds and propose to repeat the same to an  
indefinite extent is certainly not calculated  
to inspire confidence in the ability of the old  
trunk lines to exact a 30-cent rate on ex-  
ports to Europe, however it may be with  
shipments for domestic consumption.

The building operations of this year have  
been unprecedented in the history of New  
York. Notwithstanding the strikes in the  
building trades and the high price of lots,  
the plans for new buildings filed represent  
\$56,896,093 for the first 11 months of this  
year. For the 12 months of last year the  
total cost was \$45,374,013. It is believed  
that the plans filed during the present month  
will swell the total value for the year to  
about \$59,000,000.

P. B. Kent, a civil engineer who has been  
engaged in railroad work in Formosa for the  
Chinese Government, says that upon the  
accession of the young prince to the throne  
China will adopt the European railroad al-  
most universally.

Capt. Jarvis Patten, the late Commissioner  
of Navigation, is said to be engaged in for-  
mulating a uniform registry system for the  
merchant tonnage of the world.

Vessel owners engaged in the trade be-  
tween New York City and the ports in Cuba  
and Porto Rico believe they are not reaping  
the benefit of the assurance by the Spanish  
Government referred to in President Cleve-  
land's message, "that all differential treat-  
ment of our vessels and their cargoes, from  
the United States or from any foreign  
country, had been completely and absolutely  
relinquished." Information has been re-  
ceived that Spanish steamers arriving in  
less than 20 days from Spanish ports are  
admitted entirely free of tonnage dues, while  
vessels under the American flag have still to  
pay the old rates.

A junction of headings on the line of the  
new Aqueduct between Shafts Nos. 20 and 21  
was effected last week, so that now there  
are two continuous lines of excavation,  
much of it through solid rock.

The tramp problem has been solved in  
Westchester County, where the supervisors  
have authorized the construction of a tank  
apartment building on the almshouse  
grounds, which tramps will be compelled  
to bail out or drown. Tramps are not  
expected to tarry long in the neighborhood  
on account of their natural aversion to  
water treatment.

The National Wagon Manufacturers' As-  
sociation met in Chicago last week and  
adopted a resolution advancing the price of  
wagons 10 per cent., owing to an advance in  
iron and other materials used in their con-  
struction. Thirty-one manufacturers were  
present, representing 70 per cent. of the  
wagon product of the United States and an  
aggregate capital of \$10,000,000. "Though  
no formal action was taken, the general  
sentiment of the association was against the  
employment of convict labor. They say 25  
per cent. of the wagons made are made by  
convict labor, and the consequent lower  
prices have entailed great loss upon those  
not employing convicts."

In 1880 the amount of coal mined in the  
State of Alabama was 322,934 tons, while  
the output, according to the report just  
made by the State geologist, was 2,225,000  
tons in 1885.

G. S. Berry, a Visalia, Cal., rancher, suc-  
cessfully makes use of the steam engines  
which run his threshers to drag his plows.  
A single engine has 20 10-inch plows  
hitched to it, and an average of 35 acres a  
day is thus broken. The land being culti-  
vated is heavy and uneven, but that presents  
no obstacles. The fuel used in the engine is  
the thrashed straw left from last season's  
crop. Five men in all are required to operate  
the machine at an outlay of \$11.25 all told  
daily. This makes the plowing cost 32 cents  
an acre.

Estimates of population in the Territories,  
based on the Congressional vote at the late  
election, compare with the census of 1880 as  
follows:

	1880.	1886.
Dakota.....	138,177	200,000
Washington.....	73,116	210,000
Montana.....	39,159	110,000
Idaho.....	32,610	85,000
Totals.....	282,062	605,000

The Detroit Car and Wheel Mfg. Com-  
pany will commence business in April, giv-  
ing employment to 1000 hands. They  
occupy the old shops of the Peninsular  
Car Works, and have erected two new foundry  
buildings. The enterprise will repre-  
sent an investment of \$1,000,000. Hiram  
Walker & Sons are the managers.

The North Carolina State license tax of  
\$100 on commercial travelers, the payment  
of which was resisted by L. R. Long, a non-  
resident, on the ground of its being an un-  
constitutional interference with interstate  
commerce, has been held by the State  
Supreme Court to be a valid law. Other  
State courts have heretofore decided in the  
same way with respect to such laws, but  
have had their decisions upset on appeal to  
the United States Supreme Court.

Building operations in Milwaukee, Wis.,  
during the past season afford significant  
proof of the disturbing influence exerted by  
the labor strikes of last May. In 1885 new  
buildings to the value of \$4,560,000 were  
erected, while this year the value will reach  
only \$3,720,000, or over \$800,000 less.

California in 1885 shipped 400,000 boxes  
of raisins and this year 750,000 boxes will  
be marketed. The State claims to be able to  
supply the entire wants of the United  
States and with a quality equal to the  
product of Spain. The wine product this  
year will equal 25,000,000 gallons. Of  
canned fruits the pack will exceed 500,000  
cases.

The failure of D. & J. Maguire, the largest  
shipping firm in Quebec, was followed by  
a statement to the creditors showing  
\$227,000 liabilities and \$300,000 nominal  
assets. It is understood in Montreal that  
the failure was caused by overtrading and  
the purchase of too many ships for the  
firm's capital, the immediate suspension  
being credited in part to the action of a  
large creditor and in part to large losses  
sustained by the cholera in Brazil, to which  
country large shipments of lumber have  
been made by the firm.

The Baltimore and Ohio Railroad tunnel  
at Fairmount Crossing, in Philadelphia, was  
completed recently at a cost of \$1,000,000.  
There were used in its construction 4,250,-  
000 bricks, 60,000 barrels of cement and  
30,000 pounds of dynamite. Its length is  
4780 feet.

Of late years some American plows and  
agricultural machinery have been intro-  
duced in Morocco, but Consul Mathews says  
there is no end of difficulty to wean the  
natives from the customs of their sires, and  
the introducers of the implements must  
either work themselves or get foreign work-  
men to do so until the natives learn their  
management.

Governor Swineford, of Alaska, in his  
annual report estimates the white popu-  
lation of the Territory at 3250, and the  
native population at 20,000. Of the native  
Alaskans he says that they are a very  
superior race intellectually as compared  
with the people generally known as North  
American Indians, and are as a rule indus-  
trious and provident and wholly self-sus-  
taining. They live in neat, comfortable  
homes of their own construction. They are  
shrewd and natural-born traders, some are  
passably good carpenters and others are  
skilful workers in woods and metals. The  
industries of Alaska, says the report, are as  
yet principally confined to the fur trade,  
mining and the curing and canning of fish.

The financial losses by lake disasters the  
past season aggregate \$1,500,000, and 138  
people were drowned. Notwithstanding this  
drawback it is stated that the lake carriers  
have realized 20 per cent. profit on the  
money invested.

A San Francisco paper says the granting  
of the contract for cruiser No. 2, the  
Charleston, to the Union Iron Works, for  
\$1,017,500, or a little over \$1,000,000,  
makes a new era in manufacture in that  
city. Besides the labor that it will provide  
for workmen and the stimulus that it will  
give to trade it will help in many important  
industries.

There are many conflicting rumors re-  
specting the probability of war in Europe,  
arising mainly from the proposed increase of  
the German army, military movements in  
Russia and the attempt by France to create a  
military establishment of the first rank. A  
New York gentleman who recently returned  
from a sojourn in St. Petersburg says: "No  
other power will be in a hurry to set Europe  
in an uproar if Germany says 'No.' \* \* \*  
Neither Germany nor France may be now en-  
tertaining the design of attacking the other.  
And yet they are both so proud, sensitive  
and suspicious of each other that a single  
imprudent or incautious act or word may  
set them in battle array. But there is noth-  
ing in the mere fact of their increased mili-  
tary preparations to lead us to believe that  
war between them is imminent."

Steel is gaining favor among shipbuilders  
on the lakes, where the profitable freights of  
last season have created an urgent demand  
for more tonnage. Thus far contracts have  
been let for 31 new lake craft, all of which,  
with two exceptions, will be large steamers.  
It is estimated that their combined capacity  
will reach 66,000 tons, which is an average  
of over 2000 tons to the vessel, and more  
than twice as much as the total tonnage lost  
the past season. Four of the new steamers  
will be of steel.

The Pusey & Jones Shipbuilding Company,  
of Wilmington, Del., have built over 100  
steel and iron steam vessels within the past  
25 years, of which 30 are now in service on  
the Amazon.

Tonawanda, the great lumber center of  
New York, this year approaches nearer than  
ever in importance to the leading lumber  
market in the West. During the year there  
were received by lake and rail \$18,500,000  
feet of lumber, or 14,000,000 more than last  
year. The shipments by canal were 347,-  
932,840 feet, a slight decline from previous  
years. By rail the shipments were enor-  
mous, the Central Railroad alone moving  
19,411 cars, or 2599 cars more than last year.  
The dealers complain that stock at the saw-  
mills in the West was advanced without a  
corresponding advance from buyers.



# The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, December 23, 1886.

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## The Gas Companies and the State.

The animated discussion in business circles and in the newspapers of the Reagan-Cullum bill has again brought prominently before the public the delicate question of defining the limits of State interference in the relations between the public on the one side and corporations operating under charters on the other. As is usually the case, the extremes are now only heard, and the representatives of the railroads notably are prophesying destruction to great vested interests and ruin to important business interests. We are inclined to be skeptical on these points, and cannot help believing that before many years have passed there will be a revolution among railroad men similar to that which has been quietly going on among gas managers. Gas companies formerly had the distinction of being among the first upon which the dislike of the public descended. They have certainly themselves to blame for it principally, and many of them have keenly felt the result of it through the eagerness of town authorities to give privileges to the first one who promised them the blessing of competition. Too many of those who took advantage of the antagonism of the public were men whose aim was to force the older companies to buy them out. The majority of the latter have suffered from this kind of blackmail and have grown tired of it. From an attitude of defiance, alike dangerous to themselves and to consumers, they have reached quite a different point of view. The public, too, has learned by bitter experience that to welcome sham competitors is to pay for the excitement of a brief "gas war," and to saddle itself with the interest and profits on two plants instead of one. The gas companies have therefore slowly changed front, and so far as can be judged from the discussion at the meetings of their associations, they have reached the conclusion that a guarantee of immunity from attacks is worth to them many concessions which formerly would have been denounced as the crazy claims of demagogues. The gas companies seek this protection through the agency of State gas commissions. An interesting discussion of the subject from their point of view followed the presentation of a paper by Mr. Ramsdell before the last meeting of the American Gas Light Association. We may confess that the paper itself and the tone of the discussion following it, as printed in a number of recent issues of the *Gas Light Journal*, were a revelation to us. His views are almost radical, and yet speaker after speaker rose to support them or to emphasize some of the points deserving of consideration.

The situation is regarded by the greater number of progressive gas men as follows:

We have in the past made serious blunders in neglecting to consider the fact that our investments are largely in the nature of permanent sinking of capital in plant which cannot be removed or be made available for any other purposes. While possessing a monopoly, abuse of the power thus given is likely to create opposition more or less reasonable. This finds expression in the form of encouragement to rivals, with whom often the most profitable part of the business must be shared, or the alternative be chosen of buying partly unnecessary plant and paying profits to hostile promoters. So widespread has this source of loss become that gas companies not yet attacked formerly believed it sound policy to accumulate a fighting fund. To press the maximum dividends on copiously watered stocks seemed to be the sole ambition of the management. Now the progressive men in the business recognize the folly of what was once a general tendency. Practically they say: "We are willing to put the details of our business before a State commission as the representative of the consumers, to convince them that we are ready now and in the future to deal fairly with the public. All we want is a fair profit on money actually invested, a moderate allowance for reserve and surplus and a sliding-scale arrangement by which the gas company is given a share in the distributive profits in proportion to the advantages accruing to the consumer in cheaper rates." As an equivalent they ask that they be guaranteed against competition, or, in other words, that they be given a monopoly, though the latter term is carefully avoided, probably because to many it has an odious ring.

So far as the interests of the public are concerned the principles embodied in the new movement of the gas managers are sound. We have already alluded to the fact that sham competition and the sinking of excessive amounts of capital in gas plant prejudice the interests of the consumer in the long run. If sure that they are paying only a fair profit on honestly invested funds, and that they are to share in the benefits which increased consumption and reduction in costs bring with them, the consumers will be content to abide by their part of the bargain. The leading principles being mutually acceptable, the main question becomes the elaboration of details. During the discussion of the subject at the meeting alluded to, a glimpse of the difficulties which would be encountered in this work was obtained when a figure had been named which some considered a fair rate of profit to shareholders, based on capitalization and sales. It became at once evident that what would prove an inadequate return to a company in a small town would yield enormous profits to concerns furnishing our large cities with illuminating gas. Some distrust was shown concerning the possible personnel of gas commissions, and doubts of the same character might arise, too, in the public mind. Massachusetts has had such a body for some time, and the unanimity and vigor with which representatives of that State spoke in favor of the institution nearly carried the association to the point of passing a resolution favoring their establishment in different States. It is evident, therefore, that whatever difficulties may exist they are not insurmountable. It is, we believe, a very encouraging sign when many thoughtful men representing a great interest have reached the conclusion that their own welfare, as well as that of the public, is so nearly identical that they seek the protection and co-operation of the State from which they have derived their franchise. It is beginning to be recognized that State interference in private affairs is one thing and that the regulation of the service of corporations created by the State and endowed by it with special privileges is quite another thing. We cannot but believe that the convictions of the managers of our railroad corporations will soon undergo a change in the direction in which the gas men have been progressing so rapidly of late.

There are evidences of dissolution in the great labor organizations which within two or three years have attained such prominence. The issue between the Knights of Labor and the trade unions is now well defined and practically irreconcilable. The Knights have assumed the right to dominate the affairs of the several trades, and the unions have found that self-preservation demands an unyielding resistance to the aggressions of the larger and more comprehensive society. The Knights have long recognized that, to attain the position of control to which they have from the first aspired, they must absorb the trade unions. The fact that the great secret order is composed largely of unskilled wage-earners who are ineligible to membership in the trade unions has been well known to the mechanics of the latter organizations, and it is not at all surprising that they refuse to surrender the control of their guilds to the car-drivers, railroad employees and day laborers of the Knights of Labor. When the conflict becomes general it can scarcely be doubted on which side the influence of skilled labor will be cast. Without the help of the trade unions the Knights of Labor cannot exercise a controlling influence in any line of business. They are not wise enough to recognize this and by politic means effect an alliance with the open unions, but are trying

to compel submission to arbitrary dicta by methods which are daily widening the breach and making reconciliation impossible. It has become apparent to all for whom the subject has interest that the great society of the Knights of Labor is not made up of material from which any great results can be expected. Its leaders are demagogues incapable of self-control and lacking in the qualities which fit them for the control of others. They are not organizers, and do not look beyond immediate and personal advantage. The better elements of the trade unions distrust them, and their record of defeat and disaster in the strikes they have proclaimed and conducted shows how unworthy they are of the confidence of those who are asked to surrender to them the control of their interests and the direction of their actions. We doubt if the Knights of Labor will long hold together. They are a curious phenomenon, born of discontent during depression, and are likely to die under the better conditions which attend returning prosperity. Mr. Powderly has none of the qualities which fit men for leadership, and holds his position by the grace of men who laugh at his harmless platitudes and ignore his nominal authority.

## The Wall Street Panic and Its Consequences.

The unusual excitement of the past 10 days in the financial markets will probably not be without good results in showing the dangers of speculation on a basis of fictitious values. For some time past there had been a successful effort to advance the price of a class of evidences of indebtedness, called by courtesy "securities," which have no value as investments and are not expected to have. By skillful management these stocks were advanced to a figure from which a drop of 20 to 60 per cent was possible, and to the "bear" interest desirable. Very few of those actually engaged in business in the street were hurt, but "lambs" were shorn by the thousand and parted with considerable fleece in the operation. The effect, as we have suggested, will be to make more cautious those who hope to get rich by the short cut of speculation in commodities of which they know nothing, and which are controlled by influences of which they are entirely ignorant. "Booms" are dependent upon the willingness of small capitalists to lend themselves to the purposes of those who have everything to gain and nothing to lose by sudden and extreme fluctuations in values, and whatever operates just now to make this class of victims as timid as their ignorance and defenselessness will warrant them in being will tend to preserve them from worse disaster than has yet befallen them. The fact that during the collapse of fancy stocks only one failure on the Stock Exchange was reported, is instructive. It shows the outsiders that the operators of the market knew better than to buy for themselves what their customers were so anxious to deal in.

An incident of the "little panic" in Wall street was the sudden and extreme stringency of the money market. At one time the rate on call loans was 186 per cent. This artificial locking up of money did not seriously affect mercantile interests, and was promptly relieved by shipments of money from the country banks and from foreign financial centers, and by the offer of the Treasury Department to pay \$9,000,000 of interest in advance. By these means consequences which might have been disastrous were averted, and so far as has yet appeared, the flurry in Wall street has not caused any disturbance in general business. Speculation in other lines has been neglected. The feeling seems to be that all the conditions favor a healthful and profitable activity in all departments of productive and distributive industry, and while this feeling lasts securities are not likely to be depressed to such an extent as to stop legitimate railroad building, to the disadvantage of the iron trade. The most serious of the consequences to be apprehended is the return of large blocks of American securities held abroad and a consequent drain of gold. This would cause serious inconvenience just now. It is also hinted that the losses incurred in stock speculation all over this country account for the unusual number of small failures reported, and that considerable caution is needed in scanning credits. It will not do to assume that the consequences of a gigantic and almost phenomenally successful "bear" raid are confined to Wall street, when it is remembered that the holders of the fancy stocks which dropped like lead in water are not Wall street operators, but outside speculators, most of whom can ill afford the losses which they are studiously concealing.

The widely advertised Resistance experiments which were made in England a short time ago promise to yield further interesting information on the practical value of torpedoes. Though we have already given space to a somewhat lengthy account of these trials as far as carried out at the time, we will briefly repeat that they were undertaken for the purpose of determining by precise and practical tests the nearness at which a Whitehead torpedo can be exploded without injury to a ship, the value of coal armor as a protection for the double bottom and other unarmored parts of the hull against the force of torpedoes, and the effect of a torpedo exploding in actual con-

tact with a ship. The experiments were made with the obsolete ironclad Resistance and supplied the first instance of a Whitehead torpedo having been exploded against the hull of a ship. The result, as reported at the time, was of a most unexpected character, and demonstrated very strikingly that the total disablement or destruction of an ironclad of comparatively modern construction is not so easy as many people imagined. The Resistance was furnished with defensive booms and nets and sustained little injury, though the charge of 91 pounds of gun cotton which was used was generally assumed amply sufficient to overcome the protective measures adopted. Since the termination of this first of the proposed series of trials the effect of the explosion has been generally discussed and much has been said for and against the efficiency of torpedoes. According to one view of the trial everything was in favor of the vessel, while another places the advantages of the conditions entirely on the side of the torpedo; hence the interest which has been shown in the continuation of the experiments. One point which has been brought up, and which undoubtedly is of great importance, is the amount of submersion which was given to the torpedo. This amount to give the greatest lateral effect to different charges of explosive has been ascertained by experiment, and for the charge of gun cotton used against the Resistance should certainly have been more than 10 feet, at which depth the torpedo was fired. As it was, the gas liberated by the explosion was not restrained sufficiently, so it is held, to allow of its energy being expended in the proper direction—that is, laterally against the side of the ship—but escaped into the atmosphere. To what consideration this is entitled can be decided with little difficulty by further trial. Whitehead torpedoes, we believe, have generally been run at a distance of 10 feet below the surface of the water without regard to their exploding charges, and the effect of a charge in this respect will therefore be watched with interest. Obviously a greater depth of submersion will increase the destructive power, and the torpedo may yet be shown to be a much more formidable weapon than the Resistance trial seems to indicate.

## Late Developments in the Tin Market.

New influences have been brought to bear on the tin market during December, but in order to properly appreciate them it will be necessary to examine the statistics at the beginning of the month. The following statement shows the position of Banca tin in Holland on the 29th of November from the official returns published by the Dutch Trading Company:

Statement of Banca.			
	1886.	1885.	1884.
Import in Nov. .... slabs.	5,000	4,300	18,915
Total 11 months. ....	108,317	116,876	100,116
Deliveries in November. ....	10,964	10,800	7,400
Total 11 months. ....	125,123	142,784	111,933
Stock second hand. ....	38,898	30,065	45,282
Unsold stock. ....	41,972	70,911	81,909
Total stock. ....	75,800	100,976	127,191
Afloat. .... piculs.	6,600	500	9,300

According to this statement the visible supply in Holland stood on November 29 as follows, as compared with the same date of last year:

	1886.	1885.
Banca, stock. ....	75,800	100,976
Banca, afloat, 2½ slabs per picul. ....	18,300	1,000
Billion, afloat. ....	35,056	30,568
Billion, afloat. ....	36,000	31,300
Total. ....	145,156	143,744
Decrease. ....	9,588	

While in Holland the decrease in the supply was trifling, it was considerable in Europe and America taken together, as the following particulars will show:

	Nov. 30, 1886.	Nov. 30, 1885.
	Tons.	Tons.
Straits and Australian, spot. ....	3,953	6,782
Straits and Australian, landing. ....	1,160	255
Straits, afloat. ....	1,032	475
Banca, on warrants. ....	1,057	940
Billion, spot. ....	811	648
Billion, afloat. ....	886	664
Stocks in America, including quantity afloat. ....	2,785	2,080
Total. ....	11,899	13,100
Prices of Straits and Australian. ....	£102	£98

As the month advanced news reached us from the Straits Settlements that supplies were coming in more freely there, and that the shipments would be heavy till the Chinese New Year holidays, occurring in the fourth week of January. Shipments thence during the first nine months had been 55,338 piculs to the United States, against 23,443 during the corresponding period of last year, and the import into this country during the first 10 months was as under:

	1886.	1885.
	Pounds.	Pounds.
Import. ....	33,830,455	19,761,021
Re-export. ....	148,029	58,088
Net import. ....	33,682,426	19,702,933
Decrease. ....	3,954,528	
Or tons. ....	1,778	

An increase of 178 tons per month from the Straits proves that our market has been becoming less dependent on that of London in the course of the year, and indeed New York has recovered considerably in importance, due in a great measure to the increased consumption on this side. With a continued liberal supply from the Straits in

prospect for the coming month, as we have indicated, the position of tin is less strong than it was a month since, and the price has declined correspondingly, being, moreover, influenced by the temporary stoppage of a number of tin-plate mills in Wales, owing to labor troubles. There has besides been a downward tendency in most speculative values, both stocks and merchandise, the decline being precipitated by an early winter and the approach of the dull holiday season, and less so, we are inclined to think, because there is less confidence in the future than there has been since last summer. In Europe, it is true, there are some fears that peace may be disturbed over there next spring, and many holders of commodities speculatively inflated prefer to get rid of them while the political atmosphere is less serene than it was in the summer. Tin is of course apt to be influenced by similar considerations likewise, especially at a moment when, from a statistical point of view, it is less strong.

## Steel Rail Capacity.

The capacity of the rail mills of the United States is a matter which is being talked of a good deal at the present time since it is known that very heavy sales have been made for 1887 delivery, and a considerable rise is predicted by many on the ground that the mills cannot supply the demand. A Western contemporary comes to the relief of frightened buyers with the following startling table. It appears that the journal in question has been guilty of this compilation before, and since it was unchallenged has gathered courage enough to repeat it:

Name of plant.	Converter capacity, tons.	Capacity, sections rails.
Worcester (Mass.) Steel Works.	8	50,000
Troy (N. Y.) Steel and Iron Company.	20	275,000
Bethlehem (Pa.) Iron Company.	29	300,000
Lackawanna Iron and Steel Company, Scranton, Pa.	10	185,000
Pennsylvania Steel Works, Steelton.	38	300,000
Scranton Steel Company.	12	175,000
Carnegie, Phipps & Co.	8	125,000
Edgar Thomson Works.	30	295,000
Cambria Works.	18	175,000
Cleveland Rolling Mill Company.	20	125,000
Joliet Steel Works.	16	185,000
North Chicago Rolling Mill Co.	12	185,000
Chicago plant.	30	300,000
South Chicago plant.	30	300,000
Union Steel Company, Chicago.	20	300,000
Vulcan Works, St. Louis.	14	75,000
Colorado Coal and Iron Company.	10	50,000
Total, 15 Bessemer plants.	295	3,000,000

Without claiming absolute accuracy, which is not attainable, we may put forward the following as a close approximation to the truth:

	Gross tons.
Worcester. ....	30,000
Troy. ....	65,000
Bethlehem. ....	180,000
Lackawanna. ....	145,000
Pennsylvania. ....	175,000
Scranton. ....	125,000
Carnegie's two mills. ....	190,000
Cambria. ....	180,000
Cleveland. ....	100,000
Joliet. ....	145,000
North Chicago. ....	350,000
Union. ....	78,000
Westers. ....	75,000
Colorado. ....	30,000
Total. ....	1,775,000

This estimate we believe will be received by the majority in the steel-rail trade as a very liberal one, although we have heard good authorities go higher even. Crowding the mills as fast as possible, and using imported or domestic blooms wherever rolling is greater than steel-making capacity, may possibly carry the maximum possible output above 1,800,000 tons. But accidents, delays, failure of supply of raw materials, or any of the other contingencies which may disturb very fast work, are more likely to keep it down to 1,600,000 or 1,700,000 tons. This year the mills enumerated above make just about 1,400,000 tons out of an allotment of 1,450,000 tons. By what process of reasoning the compiler of the first table quoted contrived to reach the conclusion that in 1887 the rail mills would do more than twice their make in 1886 it is somewhat difficult to understand. Such wild figures are apt to give considerable trouble, though, for security's sake, we will assume that the unit not specified, taken by our contemporary, is the net and not the gross ton. It may be of interest to state in this connection that according to a gentleman now in this country, prominently connected with the English steel rail trade, the capacity of the mills in Great Britain is between 1,600,000 and 1,700,000 gross tons annually, which is enormously in excess of current requirements.

Enormous as has been the output of ore in the Lake region during the year 1886, it is sure to be much heavier even in 1887. Before the end of the current year the total shipments may aggregate 3,550,000 tons, because some ore is to go overland, chiefly into the Chicago district, from the Gogebic range. It is to be expected that during the winter very extensive preparations will be made at all the mines to push development work and get ready to cover all requirements in 1887. As we have already intimated, the heavy sales of steel rails have caused extensive covering of raw materials, and news comes from Cleveland and from Chicago, which is now becoming a greater ore market, that there have been very heavy sales of ore, chiefly of the Bessemer grade, for next season's delivery. That this is only natural is evident



when it is considered that the sales of rails to date are over 1,000,000 tons, against 575,000 tons at the same time last year. Estimates of the transactions in the Cleveland market vary from 600,000 tons to over 1,000,000 tons of ore, on which an advance over figures formerly ruling has been secured. An item of uncertainty is the Lake freights, and a number of the mines, declining to take risks of high rates, are selling their ore on cars at the mine. It is evident that an enormous business is now being crowded into a very short time and at an exceptionally early date. In some respects this lends more encouragement than is desirable to the more speculative element. The general situation indicates a temporary lull which, however, seems likely to be beneficial rather than detrimental to the trade. Work enough has been secured to make manufacturers confident, and a period of quiet will relieve the strain under which all have been laboring thus far.

Mr. Percy Gilchrist, one of the inventors of the basic process, sends us a very interesting modification to illustrate the growth of that modification of Bessemer steel manufacture. The makes of the various countries for the 12 months ending September 30, 1885 and October 31, 1886, respectively, were as follows:

	1885.		1886.	
	Total tons.	With under 0.18 % carbon.	Total tons.	With under 0.17 % carbon.
England.....	145,707	70,813	258,466	161,908
Germany, Lux- embourg and Austria.....	617,514	424,862	883,859	651,529
France.....	130,283	62,300	122,711	77,141
Belgium and other coun- tries.....	51,514	42,118	48,505	36,718
Total.....	945,317	600,183	1,313,631	927,294

In spite of the depression in the steel trade abroad, which has probably led to a slight decline in the make of the countries named, the output of basic metal has jumped from 945,317 tons to 1,313,631 tons, or 38.9 per cent. The most significant fact, however, is the increase in the make of low carbon or mild steels, which show a growth of 54.5 per cent., while the higher steels, presumably chiefly for rails, exhibit a growth of 11.4 per cent. This emphasizes in a most striking manner the impression which has long been general that the basic process is particularly suitable for the softer grades, and is the most dangerous competitor of high-class irons. It is to be regretted that Mr. Gilchrist has not chosen the calendar year for the compilation of his figures, because that would allow of a closer comparison between the total make of steel from converters and that of peroxide of lime. Nearly all the basic slag made in Germany is very finely ground and used in place of superphosphates. In other words, nearly one-half of the cinder is now being utilized, though, so far as we understand, the revenue from this source is not as yet important enough to play a rôle in the cost of manufacture.

The action of the House of Representatives on Saturday, in defeating the motion to take up for consideration the bill introduced by the Ways and Means Committee providing for a revision of the tariff in the interest of free trade, is calculated to set at rest a good deal of speculation as to the probable action of Congress in economic questions during the present session. This is a cause for congratulation. However general may be the conviction that a judicious revision of the tariff would be advantageous to all interests affected, the work was not approached by the present Ways and Means Committee in the proper spirit. The question, involving so many interests, needs to be taken up in a very different way from that selected by Mr. Morrison and his friends. The conservation of our industries and the welfare of the millions dependent upon our industrial prosperity demand a high grade of practical statesmanship in dealing with this delicate question of changing and readjusting protective duties. It does not admit of doctrinaire solution, and in refusing to give up the session to Mr. Morrison the House has shown excellent sense.

Obviously the railway and canal transportation interests of the State of New York are in direct conflict. So long as open navigation makes it possible for the canal to compete with the trunk lines the latter suffer in their earnings to an extent equal to the difference between winter and summer rates for transportation. The present winter is no exception to the rule. Promptly with the close of navigation comes the announcement that the "Central Traffic and Trunk Line" associations have determined to advance east-bound freight rates (beginning December 20) until transportation by water is made possible in the spring. The new schedule advances rates on all freight from the West to the East from the basis of 25 cents per 100 pounds, Chicago to New York, to 30 cents per 100 pounds. The enlargement of the canal locks, to be completed by spring, has already commenced at Syracuse. But the railroads are

preparing to oppose further expenditure on the canal, and will be heard from in the next Legislature. The anti canal feeling is being stirred up in the back counties. It so happens, as the friends of the canal—by this meaning the mercantile classes—have discovered in the nick of time, that these counties are the very ones that depend most largely upon the bounty of New York, Kings County, Westchester and Albany for an inordinate share of the school fund under a pernicious system of taxation permitting this abuse. It is pertinently suggested that the river counties should co-operate to abolish the school tax.

The American Shipping and Industrial League hold a convention in Washington city next month, and those most prominently identified with it claim that it is "destined to be the most powerful organization that has ever come to the relief of the American ship and its companion industries." The league is uncompromisingly opposed to "free ships," claiming that we can better afford to build our own ships than to buy them. It will remain with the league to show in what way the American ship can be run profitably.

## WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., December 21, 1886.

The Morrison phase of the tariff contest having been disposed of, the question in the House of Representatives now resolves itself into the elementary proposition, for the present, of a reduction of the surplus revenues. Notwithstanding the co-operation of the Administration Mr. Morrison secured but four votes from the list of protective Democrats. The roll of the House represented 322 votes, three members having died. There were 303 votes cast. There were, therefore, 19 absentees, 14 of whom were paired and five were absent without pairs. Of the original 35 Democrats voting with Randall but 26 were enrolled on his side this time. Of the five original Republicans voting with Morrison four repeated their vote, and two Massachusetts men increased the Republican affirmative vote to six.

### REVENUE REDUCTION.

As Congress will adjourn to-morrow over the Christmas holidays, no further steps will be taken to tackle the question of revenue until after the reassembling on January 4. Colonel Morrison is no longer an aggressive factor in the contest, although he may be an obstructive agent in preventing action to diminish redundant revenues, which is generally conceded as necessary during the present session. The friends of Mr. Randall are now canvassing the House with a view to the preparation of a measure which will meet with the support of the internal-revenue repeal Democrats and Republicans. Mr. Randall himself is of the opinion that nearly, if not quite, two-thirds of the House can be concentrated on such a measure. A bill embracing these points is now being thought over. It will provide first for the enactment of the administrative features proposed by Mr. Hewitt; second, repeal of the tax on tobacco; third, repeal of the duty on spirits distilled from fruits; fourth, repeal of special licenses. This will make a reduction of about \$50,000,000 of the surplus. There is some talk of reducing the tax on spirits from 90 to 50 cents a gallon, and a reduction of 10 per cent. on the duty on sugar. It is not probable that either of these propositions will be experimented with at this session.

### TARIFF REVISION.

The subject of tariff revision has been abandoned by both parties by mutual consent for the present session. That it will come up by the same mutual consent and pledges of both parties at the next session there is no doubt. The entire system of the tariff from the first line after the enactment clause down to the last item in the free list will be overhauled. The greatest contest had of late years over the tariff will be had then. The question will be put in position for the national campaign of that year, and will be disposed of promptly by the people and in a manner which will leave no doubt as to their attitude upon the question. The next developments in the parliamentary features of the tariff controversy will be a recognizable and growing support from the South. The delegation from Virginia in the next Congress will have a majority of tariff Republicans, which is a complete revolution, as the present delegation has a majority of free-trade Democrats. There are also signs of decided hedging in Tennessee, West Virginia and Alabama.

### ANOTHER CRUISER TO THE CRAMPS.

The action of the House Naval Committee will doubtless lead to the award of cruiser No. 1, the Newark, to the Cramps, of Philadelphia. The original resolution as sent down from the Navy Department authorized the Secretary of the Navy to advertise on the basis of a higher limit of cost. The committee amended the resolution so as to require the Secretary to award the contract to the lowest available bidder. If the resolution passes in this shape, as it is likely to, the Cramps will secure the contract.

An analysis at Leadville of many thousand tons of fine dust from lead blast furnaces showed its composition to contain the following: Silver, from 20 to 37 ounces per ton; lead, from 30 to 30 per cent.; gold, from trace to  $\frac{1}{4}$  ounce per ton; zinc, from  $\frac{1}{2}$  to 9 per cent.; arsenic, from trace to  $\frac{1}{2}$  per cent.; silica, from 18 to 27 per cent.; iron, from 11 to 25 per cent. At the Arkansas Valley smelter this dust is worked with water, and slaked lime is mixed and made into bricks in a pug mill similar to those in use at a brickyard. The place in which the work is done is surrounded by a brick wall, to prevent the interference of the winds, as the material is very light. The dust bricks are sun-dried and again fed into the large furnaces.

## Labor Troubles.

To the Editor of the Iron Age: After 30 years of the vicissitudes of industrial life as operative and employer I did hope to let labor troubles alone and allow the engineers in charge of the clogged wheels of industry a chance to make their repairs and start the train without the advice of all the passengers and the newsboy, but advice is pouring in at such a rate that I shall undertake a diversion in favor of the engineers by calling attention to some of the advice, and perhaps after all may give some conclusions drawn from my own experience.

In an article in the *Forum* for November Mr. Carroll D. Wright says: "Labor troubles proceed from two general causes—ignorance and intelligence; ignorance on the part of the wage-worker of the true conditions necessary to the successful production of goods, and intelligence on his part gained through contact with men, through the common schools and through reading of what constitutes a happy environment in the present civilization." He also says: "The enlightenment which has come of partial knowledge of the conditions of production demands organization not only of the labor forces, but of the capitalistic forces, of the country."

This is pouring oil upon troubled waters with a vengeance. Only one side to blame. Both sides marshal forces to the front. To begin with the second clause of the quotation first, the intelligence of the wage-worker. It is generally considered that contact with men, attendance of common schools and reading do not tend to narrow the human mind and breed envy and discontent; but rather that they expand our views and teach that happiness and contentment, and even civilization itself, do not depend upon such luxuries as can only be afforded by the rich. And, however much intelligence may raise our ideas of what constitutes a happy environment, this same degree of intelligence is supposed to enable us to provide more easily for our wants in legitimate ways. Were it otherwise, then truly the condition of the slave or the savage would be more tolerable than that of the free laborer. The crime of too much general intelligence in wage-workers is a strange charge to bring in these times. I cannot but think the clause in question was put forth without due consideration of its import.

As to some other parts of the statement I agree with Mr. Wright most cordially, that labor troubles proceed very largely from ignorance—ignorance of the true conditions necessary to the production of goods, but the ignorance is not all on one side; it is about equally divided between the workman and his employer, and this condition will not be surprising if we carefully trace cause and effect. In olden time, when all work was of a domestic nature, the workman and his employer were friends and neighbors; they were acquainted, and there was a mutual confidence in good intentions, and each had the welfare of the other at heart as well as his own. There was no great gulf between them. There are no labor troubles now among farmers. I well remember when I was fresh from the farm and a greenhorn in the shop that it seemed strange to me that Uncle Ben did not invite all his workmen home to dinner with him. One evening the village expressman brought a package to the house, and I, in true country simplicity and hospitality, invited him in, to his evident astonishment. This, with other incidents of kindred character, showed me the difference in the customs and manners of people in different pursuits.

In some pursuits production goes on continuously; the farmer's corn and cattle thrive for 24 hours a day and for seven days in a week; but in industrial pursuits, whenever brain and muscle cease their activity, production ceases. This is why business hours must be devoted so exclusively to business. There is little time for sociability; the employer cannot become acquainted with the individualities and the domestic lines of his workmen, as sometimes he is scarcely able to be well acquainted with his own family, so pressing are his responsibilities. The workmen after their day's work have some leisure for rest, refreshment and sociability, but they, to avoid intrusion upon their employer's time, whose duties do not cease with the stroke of the clock, form their connections and associations by themselves, and thus the two most important factors in the production of goods have grown further and further apart, until now neither one knows much of the other, and it follows that, when but little is known, little is cared. This condition of affairs is not universal throughout the country; neither are labor strikes of universal extent; but if the frequency of both should be found about equal, which I believe, then it would seem to suggest that one is the natural concomitant of the other. The outbreaks have been in the nature of collisions between strangers, and I have known of cases wherein strangers after fighting have become the best of friends—they had become acquainted; let us hope for equally happy results now.

It would do no good to follow up with investigation to find out just who is most to blame, and have the fact acknowledged and recorded. That is not the way to settle quarrels. The capitalist has a perfect right to seek profitable employment for his money, and the wage-worker has an equal right to seek profitable employment for himself; and if the best way to do these things is to organize, then so be it; but if the spirit of organization on the one side be merely to "go agin the Government," and on the other only "to make war upon the heathen," then organization would be a failure in the production of goods. Dr. Adam Smith, in his "Wealth of Nations," holds the view that employers are always and everywhere in a sort of tacit, but constant and uniform, combination not to raise wages of labor above their actual rate. He also says: "We seldom indeed hear of this combination; it is the usual, and one may say the natural, state of things which nobody ever hears of." He might have added that to raise wages is the natural combination among wage-workers, and that both are right and proper, but take notice that in this natural combination there

is a wide margin for individual discretion. Rigid rules laid down by a general assembly for the manufacture of goods give a smart man no chance to excel, whether he be an employer or wage-worker.

The voice of the people assembled may be mighty in physical force, but it represents only average intelligence, when it is superior intelligence that we are looking for. When the workman steps forth from the ranks to a position of command he does not do so by the votes of men who are just as anxious for promotion as he is, but he goes forward on his own individual merits and in spite of the average intelligence which should hold him back. The average board of directors meet with only average success; but introduce one dominant spirit who has knowledge of the true conditions necessary to the production of goods, and who will have his way, then success becomes eminent. But what becomes of the rules? The one-man power is the force for business, and he must be free from entangling alliances.

Organize for the sake of intelligence, friendship and morality. There is no danger of a monopoly or a corner in the market in these things, but do not give any assembly of men such a command of your talents or affairs that you cannot control them yourself. It is to the individual adoption of the highest aims that I look for a happy solution of the labor problem. F. J. MASTEN.  
BELMONT, N. Y.

## New Southern Ore and Coal Developments.

To the Editor of the Iron Age: The South is now making most rapid strides in the development of her iron and coal fields. These developments have largely been confined to the Chattanooga and Birmingham districts, where there are some 27 large-sized modern blast furnaces now in operation, making about 2000 tons of "cold-short" pig iron per day from the "Clinton" ores of the upper silurian system, which abound in a continuous belt from Central Alabama up through that State, through the northwest corner of Georgia, continuing 140 miles through Eastern Tennessee, and on through Southwestern Virginia and close to the southeastern base of the great Appalachian coal fields. These ores are mixed with the brown hematites which lie in beds parallel to the southeast, about 40 miles distant, and are smelted by coke made from the coal of the adjoining coal fields. These furnaces make what is generally known as "American Scotch pig," not very strong, but very fluid, and useful in making sharp castings, such as architectural work and stoves, and useful as a mixture with the "red short" iron made from the ores of the Lake Superior mines and from Iron Mountain, Missouri. Birmingham and Chattanooga cannot be beaten in America in making low-grade pig iron, because the ores are most abundant and cheap, and coal of moderate quality lies contiguous in unlimited quantity, and limestone for flux abounds throughout the entire section. Now that Bessemer steel is taking the place of wrought iron so extensively, Southern iron-makers have naturally been anxious to find ores suitable for the manufacture of Bessemer pig. Thus far only one extensive bed of ores low enough in phosphorus suitable for this purpose has been found in the South. This is known as the "Cranberry ore," and is found in a great vein running east and west through the counties of Carter in East Tennessee, and Mitchell in North Carolina, some 23 miles in length, and crossing the State line between those States and skirting the northern base of Roan Mountain, one of the highest summits of the Appalachians, being 6397 feet above sea level. The ore exists in great quantities, being some 300 feet thick at its eastern end and tapering to about 12 feet thick at its western extremity. This great stands on edge, extending down to an unknown depth, "pitching" to the South at an angle of about 60°, and follows an irregular line of foot hills which skirt the north side of Roan Mountain, and "crops" out on the summit of these hills, which vary from 300 to 500 feet in height. It is also laid bare in the valleys of the numerous streams which run down from the side of the High Roan Mountain and cut deeply through the iron ridge at its base. The ore is a magnetic black oxide, yielding in the blast furnace about 50 per cent. of metallic iron of excellent quality for making steel. It carries a part of its own flux, and works easily and rapidly in the blast furnace. Herewith is a copy of its analysis from samples taken from the stockhouse of the Crozier Furnace, at Roanoke, Va., as analyzed by the chemist of the Chester Rolling Mills, at Chester, Pa.

Insoluble residue or silica.....	30.16
Protoxide manganese.....	0.45
Phosphoric acid.....	0.014
Sulphur.....	0.043
Alumina.....	0.77
Lime.....	8.92
Magnesia.....	2.58
Carbonic acid, water and loss.....	0.60
Magnetic oxide of iron.....	62.51
Metallic iron.....	49.27
Phosphorus.....	0.008

These samples were taken when the mines were not fully opened, and the ores contained considerable quantities of extraneous, silicious matter on the surface. The Cranberry Iron Company, a Philadelphia corporation, have opened the eastern end of this great ore bed, and have in the last five years exploited some 1500 feet of the vein, and have proved the vein to be fully 300 feet wide between the walls, and have now in sight some 40,000,000 tons of ore. This Company have been instrumental in building a narrow-gauge railroad from their mines (34 miles) to Johnson City, on the East Tennessee Railroad, and already have more orders for ore than they can fill until their mines are more fully opened. These orders are from the furnaces at Roanoke, Va.; Newport, Ky., and Chattanooga, where the Roane Iron Company are just completing a fine Bessemer plant to produce ingots for their rail mill. The South Tredgar Nail Works, at Chattanooga, have the last summer put in operation a small Bessemer converter to make steel from these ores for their nail plate. The steel made is superb, and no ore makes better pig for Bessemer steel than

these Cranberry ores. Already have the furnaces of Chattanooga and Birmingham secured sections of these ores. The Citico Furnace Company and the Roane Iron Company, of Chattanooga, and De Bardeleben, of Birmingham, have purchased portions of this ore bed; but these ores should not be carried 243 miles to the furnaces of Chattanooga, nor 400 miles to the iron works of Birmingham. In Southwest Virginia, some 70 miles north of the Cranberry ores, are vast areas of excellent coking coal, three veins of which lie above the drainage of the valleys, and one from 4 to 7 feet thick, and the same coal field contains two other beds of excellent splint coal and one seam of clean cannel coal, none of which are less than 4 feet in thickness. A company of Eastern capitalists, known as the Charleston, Cincinnati and Chicago Railroad Company, are building a railroad from Charleston, S. C., north, through that State, across North Carolina, Tennessee, Virginia and Kentucky, cutting through the great "Cranberry" ore veins, crossing for 150 miles the Virginia and Kentucky coal field, and striking the center of the "Hanging Rock" iron region of the Ohio Valley, at Ashland, Ky., on the Ohio River, where and at Iron-ton (on the north bank of the Ohio) are now nine large modern furnaces, and in the same district, within 50 miles of Ashland, are 35 other furnaces, making in all 44 blast furnaces now mainly supplied by coke from Connellsville and ore from Lake Superior and Missouri. These furnaces are now paying \$8 per ton for good ores from Michigan and Missouri, but when this great north and south line is completed these latter, but not richer, Cranberry ores can and will be laid down on the Ohio River at \$5 per ton. The distance from the iron mines is no greater than to Chattanooga, viz., 243 miles, and the great coking coal fields of Kentucky and Virginia are between the furnaces and the ore beds and extend continuously for a distance of 60 miles north from the Clinch River, in Virginia, over into Kentucky. But this is not the way to make the cheapest Bessemer pig. In the great valley of East Tennessee, somewhere between the Cranberry ore beds and those limitless coal fields will the best Bessemer iron be made as cheaply as the lowest grades of common iron can be manufactured at Birmingham and Chattanooga, and here, in this high and healthy section, must necessarily spring up the great manufacturing city of the Central South, for the greater cost of carrying these steel-making ores and this first-class coke to these distant furnaces would make a splendid profit for the works, and no iron center on the continent could compete with works so situated.

I have just returned from an exhaustive examination of the entire route of the intended railroad, in company with their chief engineer, and, after a long experience in the iron business, can safely assert that no district in America has equal advantages for making high-class iron for steel purposes to the section above named. It is expected that the railroad from Charleston, S. C., to the Ohio River will be completed within two years, as the company now have finished 100 miles of road. The grades are exceptionally good for a mountain section, being nowhere above 80 feet, except at the south side of the Blue Ridge, where, without a tunnel, a short distance is 90 feet to the mile, but this is going South, and in favor of the coal-carrying direction. By the way, the coal of Virginia is more than 100 miles nearer to the States of North and South Carolina by this line than any coal by any other route, and the grades doubly as good. Chicago is nearer Charleston this way by rail than is New York via the New York Central Road. The bridging and tunneling on this new road are unusually light, and there is now in sight a local business awaiting it sufficient to occupy all the ability of a single track railroad. It crosses every East and West trunk line of railroad south of the Ohio River; it crosses the best and broadest coal field on the continent; it cuts through the largest known beds of Bessemer ore in the country. Its Northern terminus is among furnaces that open a hungry market for all it can carry. It traverses the largest area of untouched hardwoods on the continent; it crosses through the great healthy high lands of Western North Carolina, the veritable "land of the sky," through beautiful mountain valleys between the two highest summits east of the Rockies, viz., Mount Mitchell and the High Roan; it follows the gateways of the rivers from the rich and populous valley of the Ohio straight to winter-shunning Florida through the spring climate of the southern section of the Appalachian range. A pleasant line of prosperity must follow its completed route. Its healthy air, its cool, beautiful waters, must stimulate the best efforts of human industry and intelligence.

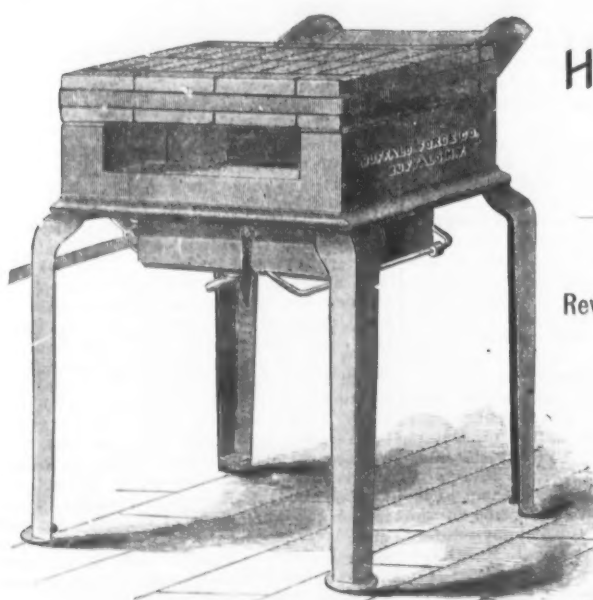
J. T. WILDER.

As regards the development of the triple-expansion engine, we find it stated that no contract has been let to build an ordinary compound engine for the English navy since January, 1885; none for the French navy since May of that year, and none for any navy within the past year. The English have now about 30 triple-expansion engines under contract for their navy, the French 10 or 12, and the Russians and other powers quite a number—in fact, all the latest designed vessels in Europe.

Mr. L. Tietjens, of Stassfurt, Germany, has recently patented an ingenious method of damming back the flow of water in shafts by the application of the well known fact that certain salts increase their volume very materially by the absorbing of water or crystallization in hardening. To accomplish this he takes either calcined soda, anhydrous alum, kiesite or oxychloride of magnesium, mixes them into a paste, and then immediately injects them through a suitably arranged pipe into the fissures through which the water flows. It is said that as this paste hardens it swells enough to fill all the interstices of the rock and to render it water-tight.



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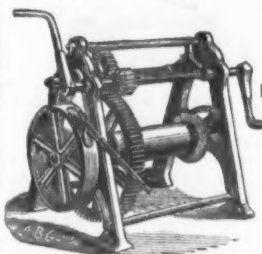
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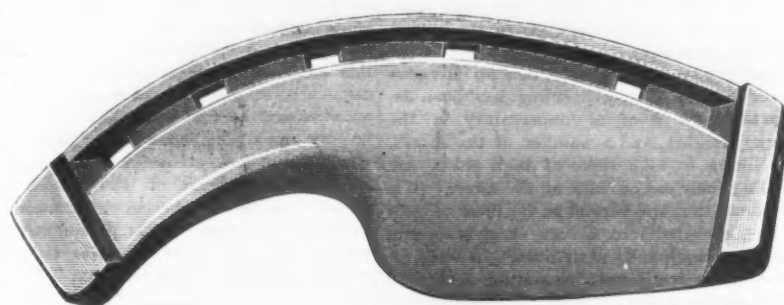


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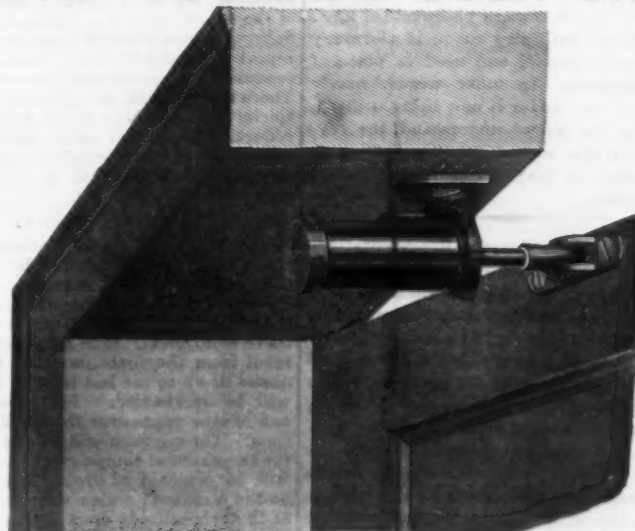
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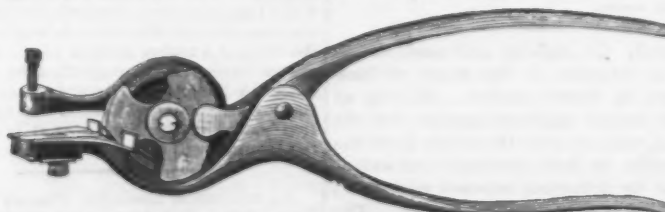
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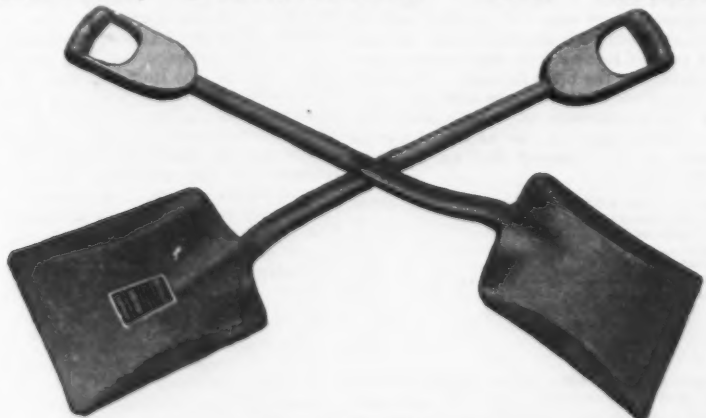
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The Co-operative Nail Works, of Steubenville, Ohio, containing one spike, three 10d., four 8d., four 6d. and four 4d. nail machines; one pair of nail plate shears, one heating and one bluing furnace; one engine, 14 x 30; one steel boiler, 5 feet in diameter, 10 feet long, with 4 1/2 inch tubes; shafting, belting, grindstones, scales, &c. The works are in complete order for making nails of all sizes from 3/4 finishing up to 8-inch spikes. Has only run three months. Machinery brand new. Coal or natural gas can be used for fuel, as desired. Address all inquiries to

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for best of reasons, a clean stock of Light and Shelf Hardware and Sporting Goods that will

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17 ft. 20 x 20 in. Planer.

1 Planer, 6 ft. 24 x 24 in., with chuck, &c.

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20 ft. bed, 28 in. Putnam Lathe.

16 ft. 24 in. Engine Lathe.

10 ft. 27 in. Engine Lathe.

1 Engine Lathe, 8 ft. x 22 in., with chuck, &c.

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First-class COKE FURNACE at a bargain. Close to market. Shipping facilities unexcelled. Well located as to supplies of ore, limestone and fuel. Whitwell hot blast. Abundant blowing power. Capacity from 35 to 50 tons, depending on kind of stock used. Now in operation and in good condition. "OPPORTUNITY,"

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One 3-high Lath Plate Train, 31 x 96 inches.

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One 20 in. Roll Lathe, 15 feet between centers.

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One 16 in. Lathe, 15 feet between centers.

One Planer, 36 x 36 inches. W. Sellers & Co.

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A syndicate controlling a large tract of iron, coal and limestone lands in East Tennessee, on two leading railroad lines, contemplates the erection of two furnaces, to be advantageously located, for the reduction of the steel ores of North Carolina, the brown hematite ores of Georgia and the red hematite ores found on the property, for the transportation of which suitable contracts for an extended period can be made. The syndicate desires to associate with practical iron manufacturers who would be willing to furnish one-half the capital required and devote their personal energies to the development of the business. For particulars address

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American Diamond, R. B. Co.'s make, with 700 feet of drill rods and all necessary connections, in good working order. Take 12 inch core. Address

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Superintending Engineer for a large works engaged in manufacture of general machinery in an Eastern city. Must be experienced and energetic. Address confidentially, with full information, "A. A. B.,"

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Second-hand Machinery in Good Order. For Sale Cheap.

1 Engine Lathe, 30 in. x 17 ft. bed. Fond.

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1 " " 24 in. x 12 ft. bed. Fined.

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1 " " 20 in. x 8 and 10 ft. bed. Putnam.

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1 Planer, 26 in. x 20 in. x 8 ft. Pond.

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1 " " 28 in. x 28 in. x 5 1/2 ft.

1 Shaper, 16 in. stroke. Very good. Wm. Bement & Sons.

1 Shaper, 10 in. stroke. Gould.

1







## Trade Report.

### New York.

**American Pig.**—On Saturday last the Thomas Iron Company closed their books, their contracts aggregating about 150,000 tons for 1887 delivery, so that some capacity is said to have been kept open to meet the demand from small consumers. It is stated that the orders of a number of large buyers were cut down, in some instances fully one half. Some of the other Lehigh companies report that, being unable to fill their 1886 orders, they will have to allow deliveries to run over into next year, which somewhat reduces the quantity available for deliveries early in 1887. On the latter they have sold up very closely. Some of the North River furnaces have only been booking to a moderate extent. Opinions are divided concerning the question whether or not consumers, fearing a rise, have put in orders really in excess of their requirements, so far as they are able to judge at the present date. It is probable that this has been done in a number of cases. The Southern furnaces have not sold much in this market thus far, chiefly because the freight rates have not been settled yet. For current deliveries a good deal of trouble is being experienced with the lack of capacity of the transportation companies. In Forge Irons the demand in this market is limited, and North River brands are available at \$17. We quote for No. 1 Foundry \$20 @ \$21 for standard brands; No. 2, \$19 @ \$19.50, and Gray Forge, \$17 @ \$18.

**Scotch Pig.**—The advance abroad and higher freights have kept pace with higher prices for American, and the market is quiet but firm at our quotations, which we revise as follows: Coltness, \$22 @ \$22.50 to arrive; Shotts and Langloan, \$21.50 @ \$22; Summerlee, \$21.50 to arrive; Dalmeilington, \$20 @ \$20.50; Clyde, \$20 @ \$20.50, and Eglington, \$19.50 @ \$20.

**Bessemer Pig.**—There have been sales aggregating between 6000 and 7000 tons of Foreign, partly in bond, duty to be paid by buyers, at the equivalent of about \$20.25 @ \$20.50 ex ship.

**Bar Iron.**—The market is steady, and some leading mills are unable to take orders for January delivery and decline business beyond that. We quote Common 1.70¢ @ 1.80¢; Medium, 1.80¢ @ 1.90¢, and Refined, 1.95¢ @ 2.15¢, for round lots on dock. The local stove trade has been more satisfactory of late, and the volume of business has increased considerably.

**Structural Iron and Steel.**—A number of good orders have been booked during the week, but on the whole the demand for building purposes has fallen off, as is only natural during this season of the year. We quote according to quality, for Angles, 2.25¢ @ 2.50¢, delivered, and Tees at 2.7¢ @ 2.9¢, for round lots. Steel Angles are quoted 2.40¢ @ 2.60¢, according to quality. Store quotations remain 2.60¢ @ 2.75¢ for Angles and 2.9¢ @ 3¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

**Plates.**—We quote for round lots: Common or Tank, 2.45¢ @ 2.6¢; Refined, 2.50¢ @ 2.60¢; Shell, 2.7¢ @ 2.8¢; Flange, 3.70¢ @ 3.8¢; Flange, Extra, 4.1¢ @ 4.2¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.90¢ @ 3¢; Ship, 3¢; Shell, 3.1¢ @ 3.50¢; Flange, 3.70¢ @ 3.90¢, and Fire-Box, 4.1¢ @ 4.5¢, on dock.

**Merchant Steel.**—We quote nominally for the range of ordinary to good grades as follows: American Tool Steels, 7½¢ @ 9¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13¢ @ 15½¢; common grades, 7¢ @ 9¢; Crucible Machinery, 3.75¢ @ 4.50¢. The Steel Association quote base prices: Round and Flat Spring, 2.6¢; Round-Edge Tire, 2.3¢; Square-Edge Tire, 2.5¢; Toe Calk, 2.4¢; Sleigh Shoe, 2.2¢ @ 2.5¢; Open-Hearth Machinery, 2.5¢, and Bessemer Machinery, 2.5¢.

**Steel Rails.**—The market has been quiet during the week, and no sales of any consequence are reported by Eastern mills, while Western works have only booked a few large orders. There are still heavy inquiries in the market, but in the case of at least one prominent order figuring with importers is going on. Some of the mills still have room for January and February work, and are receiving \$36. The decline in railroad stocks and the restriction of credits which it has given rise to, coupled with the discouragement it at least temporarily gives to new enterprises, constitute a check which might have been felt by the Rail mills were not their position as sellers so very strong. For more than one reason it is welcomed as stopping an unhealthy development of the railroad interest.

**Rail Blooms.**—There has been some business during the past week, and prices have since hardened, \$30 at tidewater being asked. There are inquiries aggregating 20,000 tons in the market, with little prospect of business being done at the current prices. Foreign mills are quoting 72/6 @ 75/.

**Billets and Slabs.**—There have been a number of sales of Foreign Billets, among them one of 2000 tons. A number of large orders are in the market. We

quote \$30.50 for 4-inch Billets. Of Nail Slabs several thousand tons have been sold to Eastern Nail works. The quotation now is \$30.50 at tidewater or \$31.50 @ \$32 delivered at buyers' works.

**Wire Rods.**—The market is firm, but quiet, there being a demand only from those Wire mills which are located near the coast. We hear of sales of occasional lots of 1000 tons at full prices. The German works are holding for higher prices, cable quotations ranging from 108/ to 112/ at shipping port. We quote \$39.50 @ \$40.

**Old Rails.**—We note sales during the week aggregating about 5000 tons, of which 1000 tons were Bridges, the bulk of the balance being Foreign T's largely for the West. Small spot lots of American T's have been offered at \$24 @ \$24.25, sales at the latter figure having taken place. The Galveston lot alluded to in our last, ranging between 5000 and 6000 tons, has not yet been placed. The foreign markets are excited, judging from the wide fluctuations in private cables received, going as they do from 72/6 to 75/ for T's and from 75/ to 79/, c.i.f., for Double Heads. Considerable blocks are offered at about \$24.50 for T's and \$25.75 for Double Heads for early shipment. We quote \$24 @ \$24.50 for T's and \$25.50 for Double Heads.

**Scrap.**—A number of small lots have been sold during the week, in some cases at \$21, from yard. Foreign Scrap may be quoted \$21.50 @ \$22 for shipment. For No. 1 yard Scrap we quote \$21.50 @ \$22.

**Rail Fastenings.**—The larger mills are booked heavily, in some cases up to full capacity for the first six months. Smaller mills and outside works are not so well provided with orders. We quote Spikes 2.25¢ @ 2.40¢, delivery New York. Angle Fish Bars may be quoted 2¢ @ 2.10¢. Bolts and Square Nuts are 2.85¢ @ 3¢, and Bolts and Hexagon Nuts 3.10¢ @ 3.25¢.

## Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, December 21, 1886.

The market during the past week has been feverish and unsettled, but on the whole has worked in the direction of higher prices. Pig Iron is harder to buy although not notably dearer. Finished Iron is firm, and on Skelp and Bars probably 0.05¢ @ 0.15¢ dearer. Foreign Iron is higher, the advance in Blooms and Billets being from \$1 to \$2 per ton. A considerable business has been done during the past three or four days, about 10,000 tons Nail Slabs and Sheet Billets for rolling into Sheets having been taken at rates quoted below. Steel Rails are about \$1 higher, and Old Rails and Scrap Iron \$2 above last week's prices. The general demand keeps up remarkably, all classes of buyers being well represented, showing that consumption is well distributed and likely to be very large during the winter and spring months and probably during the entire year. Prices may go somewhat higher, but with the enormous production, present and prospective, it is a matter of serious doubt whether they can be maintained for any length of time.

**Pig Iron.**—There is not much change to notice, and, in fact, no great amount of business has been transacted since about the middle of the month. There is but little Iron for sale, and what there is is held at figures which at the moment do not encourage buyers to take hold. At about \$17.50 for Gray Forge and \$19.50 @ \$20 for No. 1 Foundry there might be some inducement to buy, but at \$18 and \$20.50 @ \$21, which are ordinary quotations for good brands, it is thought best to hold off for further developments. What the outcome will be is hard to foretell. At first sight higher prices seem to be almost inevitable, but on a closer investigation that opinion would be considerably modified. For instance, there is scarcely any Iron for sale, even at full quoted prices. Per contra buyers have bought so much that very little will be required except to meet the current requirements of small consumers. Furthermore, the output of Pig Iron is steadily increasing, and it is by no means certain that consumption three months hence will have increased in proportion. Prospects are good, but a few weeks' time may develop quite a change, and a very little change indeed would turn the scale. In fact, the increase in production may of itself bring about that result even if consumption is maintained, because, once it is found that there are more sellers than buyers, prices begin to drop and a rally is almost impossible. Materially higher prices therefore do not seem to be warranted under present conditions, although it is quite possible that in the desire to buy there may be yet further advances. Meanwhile prices are about \$20 @ \$21 at tide for good brands of No. 1 Foundry Iron, \$18.50 @ \$19 for No. 2, and \$17.50 @ \$18 for Gray Forge. Some ask still higher prices, and at inside quotations it would not be easy to pick up anything but small lots.

**Foreign Iron.**—There is a very considerable inquiry for Bessemer Pig, both for open-hearth and other purposes. Prices are held at higher figures than they were a week ago, say \$20.50 for ordinary, and \$21 @ \$21.50, c.i.f., duty paid, for special brands. English 20¢ Spiegel, \$25.50 @ \$29. Large sales of Bessemer appear likely to be closed in a few days' time at about the figures

above quoted. A sale of 12,000 tons Foreign Bessemer was closed to-day at a fraction less than \$20.50, c.i.f., duty paid.

**Blooms.**—A large business has been done in all the lower priced Steel Blooms and Billets, probably 10,000 to 15,000 tons, within the past week, at prices somewhat below these now quoted, which are the usual asking rates, viz.: Rail Blooms at \$30, c.i.f., duty paid; Nail Slabs, \$30.50 @ \$31; Sheet-Iron Billets, \$33 @ \$34; higher qualities for Boiler Plate, &c., \$36 @ \$40. American Blooms as follows: Charcoal Blooms, \$53 @ \$54; Runout Anthracite, \$45 @ \$46; Scrap Blooms, \$35, and Ore Blooms, \$34 @ \$35.

**Muck Bars.**—Prices are again dearer, \$32.50 @ \$33 at mill being firm quotations, and it is not at all certain that orders could be placed at the inside quotation.

**Bar Iron.**—There has been a good demand, particularly from car builders and other large consumers, so that prices show increasing firmness. Mills are nearly all as full of work as they care to be at present quotations, the object now being to secure better prices rather than more business. Skelp Iron is dearer, and under a very heavy demand prices have been advanced to about 2.10¢ @ 2.15¢ for Grooved and 2.4¢ @ 2.45¢ for Sheared. Bars are 2¢ @ 2.1¢ for best makes. Medium quality, 1.85¢ @ 1.9¢.

**Plate and Tank Iron.**—New business has not been abundant of late, but mills have so much work on hand that they would just as soon wait until after the holidays before extending their engagements. A large amount of business is in sight, and there is every reason to expect quite a heavy demand a few weeks later on, and it is thought at better prices than those now ruling. There are some mills ready to take a moderate amount of business at quoted rates, but they are not pushing matters, feeling confident that in any event prices will be no lower than herewith quoted, say: Ordinary Plate, 2.40¢ @ 2.45¢, delivered; Tank, 2.45¢ @ 2.50¢; Shell, 2.7¢ @ 2.75¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4.1¢ @ 5¢.

**Structural Iron.**—Business is hesitating a little, and it is not expected that much will be done until the turning of the year. There is plenty of work on hand, plenty more in prospect, so that there is no uneasiness in regard to the future. Prices firm as last quoted: 2.4¢ @ 2.5¢ for Bridge Plate; 2.15¢ @ 2.25¢ for Angles; 2.7¢ @ 2.8¢ for Tees, and 3¢ for Beams and Channels.

**Sheet Iron.**—The demand has been well maintained, and in Heavy Sheets particularly the movement is very active. Prices are unchanged, but very firm, as follows: Best Refined, Nos. 26, 27 and 28, 3½¢; Best Refined, Nos. 18 to 25, 3½¢; Common, ¼¢ less than the above. Best Bloom Sheets, Nos. 26 to 28, 4½¢ @ 5¢; Best Bloom Sheets, Nos. 18 to 21, 4½¢ @ 4¢; Blue Annealed, 2.75¢; Best Bloom, Galvanized, discount, 57½¢; Common, discount, 60½¢.

**Steel Rails.**—Prices are again dearer, \$37 at mill being the usual quotation at all Eastern mills. There is a good deal of inquiry, but, as 1,000,000 tons have already been bought for next year's delivery, it is hardly likely that any one is suffering for want of Rails. At the same time inquiries are made by bona fide buyers, and it is not unlikely that still higher quotations may be made at an early date.

**Old Rails.**—There is an active demand and prices are again higher. Double Heads for shipment are now held at about \$26.50, with buyers at about \$25.75 @ \$26. Sales have been made at over \$25 for T's, and holders are afraid to name even \$25.50 @ \$26 as a firm quotation for additional shipments.

**Scrap Iron.**—Market firm and advancing, with very little of anything for sale. Asking prices about as follows: No. 1 Wrought Scrap, tidewater delivery, \$22.50; Selected do., \$23 @ \$23.50; No. 2 do., \$14.50 @ \$15.50; Turnings, \$14 @ \$14.50; Old Car Wheels, \$17 @ \$17.50; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$15 @ \$16; do. Turnings, \$10 @ \$10.50.

**Wrought-Iron Pipe.**—There is a good demand for Pipe of all sizes. Prices are held very firm. Butt-Welded Black and Galvanized have advanced 2½¢ respectively. Discounts are as follows: Lap-Welded Black, 52½¢; Butt-Welded Black, 35¢; Butt-Welded Galvanized, 25¢; Lap-Welded Galvanized, 35¢; Boiler Tubes, 45¢.

**Nails.**—Considering the season, which is the duldest of the year, the demand is very strong. Prices have been advanced 5¢ per keg, making store price \$2.25. The decreased product has materially assisted in the present advance.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., December 21, 1886.

Never before, probably, has there been such a demand for holiday goods as at present, and this may be regarded as a good indication of the times. The general position of the Iron and Steel trade continues satisfactory, notwithstanding there is usually a lull in December, but this month is an exception, as instead of falling off it is increasing. Mills and furnaces are all busy, and the Iron and Steel workers are fully employed. A commission of United States engineers have been in session here for a day or two with the Monongahela Navigation Company, as

well as Coal and river men, with a view of the United States Government buying the locks, dams, &c., belonging to the company and making the river free. The Coal trade of the Monongahela Valley is immense, the shipments by river annually reaching something like 100,000,000 bushels, which is distributed in down river markets from Cincinnati to New Orleans. The tolls paid to the navigation company amount to some \$200,000 per year. It is probable that the matter will be brought up before the present Congress, and it is not likely that there will be much opposition to the scheme, which promises good results.

**Pig Iron.**—There is no abatement in demand, which is nearly always light this month, but the present December has been an exception, as the business of this month will probably be fully up to that of November, which was, it is believed, the largest in the history of Pittsburgh and vicinity, by which we include the Shenango and Mahoning valleys. There is no apparent abatement in consumption, which has been unprecedented since July last, and, with the exception of some furnaces which have been obliged to bank up for want of Coke, the furnaces in this district are all in full blast, many of them being sold from one to three months ahead. Prices continue strong, and during the week under review a further advance has been established. Sales of Mill Irons show an advance of from 25¢ to 50¢ per ton, and it looks as if the highest price had not yet been reached. Some of the knowing ones predict that well-known bands of Gray Forge Iron will go to \$20, four months, before the close of the present year, and they will not have very far to go, as they are now worth \$19.50, four months. As compared with the lowest point, there has been an advance of from \$4 to \$5 per ton, and the higher it goes the greater appears to be the demand. It is worthy of mention that there is still an absence of speculation; all the Iron being sold is going directly into the hands of consumers, and this may be regarded as one of the most encouraging signs of the times. Some operators conservatively inclined are apprehensive that the advance has been too rapid to be maintained, but as long as speculators keep out of the market there is not much danger. We quote as follows:

No. 1 Gray Forge	\$19.25 @ \$19.50 4mos.
No. 2 Gray Forge	18.50 @ 18.75 4 "
All-Over Mill	18.25 @ 20.00 4 "
No. 1 Foundry	20.00 @ 20.50 4 "
No. 2 Foundry	19.00 @ 19.50 4 "
No. 3 Foundry	18.00 @ 18.50 4 "
Foundry Charcoal	22.00 @ 24.00 4 "
Cold-Blast Charcoal	20.00 @ 20.50 4 "
Bessemer Iron	21.50 @ 23.00 4 "

Included in the sales during the week were several lots of Gray Forge at \$19 cash; Bessemer Iron at \$21 cash, and English do. at \$22.80 cash. The latter cannot now be sold at the price quoted.

**Muck Bar.**—Continues scarce and is hard to get for immediate or even near-by delivery, as nearly all the mills making it to sell are sold ahead. Some are said to be contracted up to March. Prices have further advanced, and we now quote at \$33 @ \$33.50 cash at mill, an advance of \$1 @ \$1.50 over quotations of a week ago.

**Manufactured Iron.**—There appears to be little or no abatement in demand. Notwithstanding there is nearly always a falling off in business this month, the present December is an exception. This may be attributed to the steady advance in prices, which has caused both jobbers and consumers to buy a good deal more freely than they would otherwise have done. Mill owners are refusing to contract ahead at present prices, which we now quote on a basis of 1.90¢ @ 2¢ for merchant orders, 60 days, 2¢ off for cash.

**Nails.**—The recent advance made by the Western Nail Association is not being maintained in this market. We quote Iron Nails at \$2.10, 60 days, 2¢ off for cash, which is about 10¢ per keg less than the price made by the Western Association. Eastern Nails are being sold at \$2, delivered in Pittsburgh. There are but three factories in operation here; one of these, Chess, Cook & Co., is making Iron, while the other two, Shoenberger & Co. and Jones & Laughlin, are making Steel Nails exclusively. At Chicago, St. Louis and other points of distribution West, Steel Nails are largely in the lead, but here the local demand is chiefly for Iron Nails, which are being sold at 10¢ per keg below the price of Steel. The Nail market is in an unsatisfactory condition as compared with other branches of the Iron trade, and it may be attributed to the fact that the Nail making capacity is much larger than the wants of the country require.

**Old Rails.**—The market for Old Iron Rails continues strong, but in an unsettled condition; American, for some reason or other, have almost disappeared from view; Foreign Tees are quoted at \$27 @ \$27.50, and Double Heads at \$28 @ \$28.50, delivered in Pittsburgh. The large consumers here are pretty well stocked, and are not disposed to pay present prices. In regard to Old Steel Rails they are very scarce, but there does not appear to be as much inquiry as there was some time ago.

**Wrought-Iron Pipe.**—There was a meeting of the Wrought-Iron Pipe manufacturers in this city on Thursday last; it was largely attended and the meeting passed off satisfactorily. The only change made in prices was to reduce the discounts on Butt-Welded 2½¢, which, of course, means an

advance to that extent. Trade keeps up well, although, of course, there is not as much new business as there was in the fall, nor is it to be expected, but the mills are still busy working up old contracts. We quote discounts as follows: Black Butt-Welded Pipe, 27½¢; Galvanized do., 37½¢; Black Lap-Welded, 55¢; Galvanized do., 37½¢; Boiler Tubes, 45¢ off; Casing, all sizes, 47½¢; 2 Inch Tubing, 16¢ per foot, net; 2-Inch Drive-Pipe, 14¢; 8-Inch Drive-Pipe, \$1.40.

**Steel.**—There is a continued good demand for all kinds of Merchant Steel, and prices are firm but unchanged. American Blooms and Billets continue in demand, and prices are firm and advancing. We now quote at \$33 @ \$35 cash, according to quality, size and delivery; Foreign also tending upward—quoted at \$32 @ \$32.50; Steel Nail Slabs firm and higher; we can report a sale of 500 tons at \$33. We also report a sale of 200 tons American Crop Ends at \$25.

**Railway Track Supplies.**—There is a good demand, and, though prices remain as quoted a week ago, a further advance soon is almost certain, in sympathy with the increased cost of raw material. Spikes, 2½¢, 30 days, delivered; Splice Bars, 1.90¢ @ 2¢; Track Bolts, 3¢ with Square and 3.10¢ @ 3.20¢ with Hexagon Nuts.

**Steel Rails.**—Are quoted firm at \$36 @ \$36.50 cash at mill for delivery next year.

**Old Material.**—Of all kinds continues firm, with considerable inquiry and but little offering. No. 1 Wrought Scrap, \$21 @ \$21.50 per net ton; Wrought Turnings, \$16 @ \$16.50; Old Car Axles, \$26 @ \$27; Cast Scrap, \$16.75 @ \$17 gross; Cast Borings, \$13 gross. No sales of Old Wheels, in the absence of which we omit quotations. Sale of 200 tons Crucible Scrap Steel at \$26.

## Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., CHICAGO, December 20, 1886.

**Hardware.**—The past week was quiet and uneventful. Trade has dwindled to the customary reasonable demand for specialties and holiday goods in small lots. Some few changes in price lists were made, one being Copper Rivets and Burrs, which have been advanced to 60¢ off by makers, but does not materially alter the jobbing price. Dripping Pans have been advanced ½¢ per lb, present price being 6¢. Further concessions were announced on Wringers, brought about more especially by competition between rival manufacturers. As yet jobbers here have had no information relative to the meeting of the Lock manufacturers last week, though some changes on this line of goods are expected. Heavy Hardware continues in very good demand for the season. Large orders have been placed for Nuts, Railroad Spikes, Splice Bars, Chains and Blacksmiths' Tools. There appears to be considerable dissatisfaction on the part of jobbers over the present list price of Screws and their classification by different manufacturers. Many jobbers complain that on some sizes prices are too high and on others too low, so that they are either getting an exorbitant profit on one grade or no profit on the other. Jobbers are preparing to take account of stock and close up the year's business. The majority of traveling men are coming in from the road, and quite a number of them will change to new houses after the first of the year.

**Barb Wire.**—There are no changes to note in this market. Manufacturers continue stiff in price, and with credible persistency adhere to their resolution not to quote for spring delivery. Inquiries have been quite numerous for stocks for spring shipment, and, compared with the number, a very limited portion are accepted. In small lots jobbers continue to quote 3½¢ for Painted and 4¢ for Galvanized. There is much less business doing than the week previous. Many of the manufacturers have temporarily withdrawn from the market, while others make quotations for immediate shipment at 3.10¢ for Painted Wire and 3½¢ for Galvanized. The completion of the Pool Association has been strongly agitated in the last two weeks, and opinions relative to its final consummation are largely at variance. The same difficulty which has always existed in making an agreement between the Barb Wire manufacturers is very conspicuous. Several of the large concerns will not become members to such an association unless they secure some advantage, and others will not become members because such companies apparently obtain a better thing than they can get. This being the situation, it is almost certain that the pool will not be in operation by the first of the year, as was contemplated, and there are numerous obstacles to be overcome before its final operation is determined.

**Nails.**—Orders for Nails during the week were light in quantity and much less in number. A few orders for carlots of Steel Nails were received from large manufacturers and heavy dealers for immediate and January shipment. The falling off in demand is very perceptible, but, so far as this market is concerned, prices have been fairly well maintained under the conditions. Carlots are quoted at \$2.30, 2¢ 60 days, at mill for Steel Nails, and Iron at \$2.20. Jobbers' prices from store in small lots are \$2.45 for Steel Nails and \$2.35 for Iron, shaded 5¢ per keg in almost any quantity when accompanied with other goods.

**American Pig Iron.**—While the market for the past week was perceptibly more



Old Wheels .....	18.00	19.00
Old Rails .....	94.00	25.00
Connellsville Coke (Erick's) .....		5.85



# Trade Report.

## General Hardware.

The market presents substantially the same condition as referred to in our last week's report, the general tone being confident and hopeful, prices, especially in heavy goods, being firm with an upward tendency, and a good and increasing volume of business. As noted below, it will be seen that several advances of more or less importance have been made, which are, however, chiefly significant as indicating the tenor of the market. While there are many manufacturers who have not of late been receiving more than the usual orders for their goods, and while there are many lines of Hardware that show no change in price, it is still unquestionably true that many of the large buyers have been placing their orders for their future needs earlier and more liberally than usual for many lines of goods which are regarded as safe purchases. A feeling seems to be abroad that the advances which have been made in certain leading goods are likely to be followed by others, and a disposition is manifested to get orders in time. Some jobbing houses have, in this condition of things, been buying with considerable freedom. This state of the market, with generally satisfactory reports from retail trade, gives a feeling of exceptional confidence, and anticipations of a good business the coming year are more freely expressed.

### BARB WIRE.

There has been considerable activity in a large way, and buyers are endeavoring to place orders for January and February delivery, but can have them entered for only the early part of next month and for immediate delivery at 4 cents for carload lots. A meeting of the directors of the proposed Barb Wire pool was held recently, and the matter is progressing favorably. The Plain Wire manufacturers will hold a meeting on the 5th of January to arrange details.

### NAILS.

Following the action of the Philadelphia Nail men, the New York firms advanced the price of Iron Nails from store to \$2.25 last week, and decided to ask 15 cents extra for Steel Nails, carload lots being held at \$2.15 and \$2.30 respectively. The New York market has been quiet. Foreign Nail Slabs have again advanced.

### MISCELLANEOUS PRICES.

On another part of this page we give the new lists of Nuts and Washers as adopted December 9 by the associated manufacturers, to go into effect January 1. Their action in agreeing upon these lists, which are graded so as to correspond with the present condition of the trade and cost of manufacture, will be appreciated. One advantage connected with their use is that a line of goods—for example Square Nuts of different sizes—as now listed can be bought and sold at a uniform discount, or rather deduction, from the list, instead of, as heretofore, it being necessary to take off a different number of cents according to the sizes. The manufacturers' standard list of Hot Pressed and Cold Punched Nuts, as given above, is subject to an abatement to the general trade of 4½ cents per pound for Square, and of 5 cents for Hexagon, and the list of Washers, as given, to an abatement of 4½ cents per pound.

No action with reference to prices was taken at the meeting of the Auger and Bit manufacturers last week. The arrangement is reported to be working so satisfactorily that it is not unlikely that an effort may be made to extend the agreement to other goods in this line besides for the regular line of Augers and Bits. This matter is under advisement, and something will be done in this direction if it is found feasible.

The conference between the manufacturers of Chisels and Drawing Knives which was had last week was without other result than a confirmation of existing prices.

The associated manufacturers of Strap and T Hinges took no action of importance at their recent meeting. The situation was canvassed, especially with reference to the new competition, but no changes were made in prices. The market in this line is regarded as firm, and it is hinted that an advance may perhaps take place at an early day.

The market for all kinds of Carriage, Machine, Tire and other Bolts continues very firm, but there have been no changes since our last issue.

Cast Butts are held with much firmness by the manufacturers, but the jobbers in different parts of the country are offering them with more or less freedom at slightly better figures than is justified by the present cost of the goods.

There is little change in the market for Files, prices remaining unprofitably low and irregular. The increasing cost of the raw material is referred to as likely to necessitate an advance.

By the united action of the manufacturers of Screw Hook and Strap Hinges a slight advance has again been made.

Horse Nails continue without material change, special discounts beyond the regular being given with a good deal of freedom.

No announcement is made of any change in the price of Locks, but there are some indications which are supposed to foreshadow some agreement among the manufacturers by which better prices will be secured. Some of the makers are refusing to accept orders for future delivery at present prices, and it is claimed that the price of the raw material and the consequent increased cost of the goods require an advance beyond the extremely low quotations which have for some time been prevailing. In this condition of things the trade would not be surprised if an advance were announced before long, but of this no intimation is given by the manufacturers.

Wire Nails are held with some firmness and the extreme quotations that were recently made by some of the manufacturers are for the most part withdrawn. The leading companies are especially firm in maintaining prices, and those manufacturers who have been underselling them are showing a disposition to hold the goods with more firmness. The desirability of forming an association with a view to regulating prices has been considered, and, while there is a disposition on the part of some to enter into such a movement, it is suggested by others whose views are entitled to weight that such an effort would not probably be successful in the long run, owing especially to the large number of manufacturers now in the field, and the fact that such an arrangement would stimulate competition in a line in which goods can be produced on a small scale with comparatively little capital.

An advance was made last week in the smaller sizes of Wrought-Iron Pipe, amounting to 2½ per cent. on the gross list.

Advices from Pittsburgh are to the effect that the card rate on Window Glass has been advanced 10 per cent., to take effect immediately. This is referred to as an increase of 30 per cent. over last year's prices.

Steps have been taken by some of the leading manufacturers of Circular Mill and other large Saws looking to the formation of an association. Conferences have been held and it is intimated as probable that an organization will result.

The market for Wire remains very firm, with little change in price. The manufacturers are unwilling to take orders for future delivery at present quotations.

The market for Screws is firm and the new prices are well maintained.

Further advices in regard to Tacks corroborate the statement made in our last issue in regard to an increasing firmness in price and the disposition of manufacturers to recede from the lowest quotations made during the past season. But few public announcements have been made by them to this effect, but it is understood that the goods cannot, except in rare cases, be purchased at the old prices.

In connection with the somewhat improved outlook for Tacks it would be appreciated by the trade if the manufacturers should come to some agreement in regard to base discounts. It is exceedingly inconvenient for buyers when there is the existing diversity of first discounts, and it would seem that it might be feasible to adopt a uniform base, thus facilitating the transaction of business both by seller and buyer.

The Solid Steel Forged Shears and Scissors, which are being put on the market by the Cleveland Machine Company, Cleveland, Ohio, and are alluded to in their advertisement, page 30, are quoted at discount 60 and 10 per cent. The manufacturers emphasize the desirability of these Shears in cutting qualities and finish, as resulting from the manner in which they are made.

The Detroit Copper and Brass Rolling Mills announce, under date of December 13, that the prices of Copper Bottoms, Pits and Flats are advanced to the following figures, terms being net, cash 30 days:

### Copper Bottoms, Pits and Flats.

Per pound.  
14 ounces to square foot and heavier..... 21¢  
12 ounces and up to 14 ounces to square foot..... 22¢  
10 ounces and up to 12 ounces to square foot..... 24¢  
Circles under 8 inches diameter for Coffee Pot Bottoms, &c., 3¢ per pound over foregoing prices.

The trade will bear in mind in purchasing Wire Cloth, Green, Drab or Black, that there are two grades of it on the market, made respectively of Nos. 33 and 34 Wire. Made of No. 33 Wire it may be quoted at \$2 per 100 feet, and made of No. 34 at \$1.90 per 100 feet.

The Franklin Moore Company, Winsted, Conn., announce their prices on Charter Oak Carriage Bolts as 75 and 10 per cent. discount instead of 80 per cent.

The Wagon Manufacturers' Association, of Chicago, have advanced the price of wagons 10 per cent., owing to an advance in iron and other construction materials.

### ITEMS.

The Henry Seymour Cutlery Company, Holyoke, Mass., for whom Wiebusch & Hilger are sole agents, 84 and 86 Chambers street, New York, are about issuing a new catalogue and price list dated January 1, 1887. It is a finely printed and very attractive pamphlet, and represents their line of Shears, Scissors and Sheep Shears. With most of these goods the trade are familiar, but a new line is here presented to their attention for the first time, the Anchor Brand Straight Trimmers. These are made with nickel-plated handles and blades of the pattern shown in

the company's advertisement, page 10, and are put on the market to meet the demand for goods which can be furnished at lower prices than their regular line.

Lindsay & McCutcheon, Pittsburgh, Pa., as intimated in our last issue, are in the market to supply a full line of Wrought Iron Strap and T Hinges. J. C. McCarty & Co., 97 Chambers street, are their representatives for the sale of the goods in this market and authorized to give their best prices.

W. Bingham & Co., Cleveland, Ohio, issue a number of supplementary pages for insertion in their catalogue of May, 1886. Most of these are devoted to new goods, and some of them to lists of staple goods the prices of which were left blank in the catalogue. In this way the Screw and Bolt lists are given for the convenience of the trade. The company are evidently determined to keep their noble catalogue in the front rank.

The Penn Hardware Company, Reading, Pa., announce, December 15, that they are now again in full operation since their disastrous fire of May 17, having rebuilt on a much larger scale than before. They allude to the completeness of their factory, and also state

## WASHERS.

Manufacturers' Standard List, Dec. 9, 1886.

Diam.	Hole.	Gauge No.	Bolt.	Per pound
1/8	1/8	18	1/8	18.
3/16	3/16	16	3/16	12.5
1/4	1/4	14	1/4	11.5
5/16	5/16	12	5/16	10.5
3/8	3/8	10	3/8	9.5
7/16	7/16	8	7/16	9.
1/2	1/2	6	1/2	8.5
5/8	5/8	4	5/8	8.
3/4	3/4	3	3/4	7.5
7/8	7/8	2	7/8	7.
1	1	1	1	6.5
1 1/8	1 1/8	1	1 1/8	6.
1 1/4	1 1/4	1	1 1/4	5.5
1 3/8	1 3/8	1	1 3/8	5.
1 1/2	1 1/2	1	1 1/2	4.5
1 3/4	1 3/4	1	1 3/4	4.
2	2	1	2	3.5
2 1/4	2 1/4	1	2 1/4	3.
2 1/2	2 1/2	1	2 1/2	2.5
2 3/4	2 3/4	1	2 3/4	2.
3	3	1	3	1.5
3 1/4	3 1/4	1	3 1/4	1.
3 1/2	3 1/2	1	3 1/2	.5
3 3/4	3 3/4	1	3 3/4	
4	4	1	4	
4 1/4	4 1/4	1	4 1/4	
4 1/2	4 1/2	1	4 1/2	
4 3/4	4 3/4	1	4 3/4	
5	5	1	5	

## U. S. Government Standard Sizes Nuts.

Size.				Hot Pressed.		Cold Punched.		C. T. & D.		Tapping.	
Width.	Thick.	Hole.	Bolt.	Square.	Hex.	Square.	Hex.	Square.	Hex.	Square.	Hex.
1/2	1/2	1/2	1/2	13.	20.	13.8	21.	20.	27.	6.	9.
3/8	3/8	3/8	3/8	12.	18.	12.8	19.	18.	24.	4.5	7.
1/4	1/4	1/4	1/4	10.5	14.	11.	14.7	14.5	18.5	3.7	6.
5/16	5/16	5/16	5/16	10.	13.	10.5	13.7	14.	18.	3.	4.5
3/16	3/16	3/16	3/16	9.	11.	9.3	11.3	11.3	14.	2.5	3.5
1/8	1/8	1/8	1/8	9.	11.	9.3	11.3	11.3	14.	2.1	2.8
1 1/8	1 1/8	1 1/8	1 1/8	8.7	10.5	8.9	10.7	10.	12.5	1.6	2.3
1 1/4	1 1/4	1 1/4	1 1/4	8.4	9.9	8.6	10.2	9.4	10.9	1.3	2.
1 1/2	1 1/2	1 1/2	1 1/2	8.4	9.9	8.6	10.2	9.4	10.9	1.2	1.8
1 3/4	1 3/4	1 3/4	1 3/4	8.2	9.7	8.4	10.	9.	10.7	1.2	1.8
2	2	2	2	8.2	9.7	8.4	10.	9.2	10.7	1.2	1.8
2 1/4	2 1/4	2 1/4	2 1/4	8.4	9.9	8.6	10.2	9.4	10.9	1.5	2.2
2 1/2	2 1/2	2 1/2	2 1/2	8.4	9.9	8.6	10.2	9.4	10.9	1.5	2.2
2 3/4	2 3/4	2 3/4	2 3/4	8.8	10.3	9.1	10.6	9.8	11.3	1.5	2.2
3	3	3	3	8.8	10.3	9.1	10.6	9.8	11.3	2.2	2.7
3 1/4	3 1/4	3 1/4	3 1/4	9.3	10.8	9.6	11.2	10.3	11.8	2.2	2.7
3 1/2	3 1/2	3 1/2	3 1/2	9.3	10.8	9.6	11.2	10.3	11.8	2.5	3.2
3 3/4	3 3/4	3 3/4	3 3/4	9.5	11.	9.8	11.7	10.5	12.	2.5	3.2
4	4	4	4	10.	11.15	10.3	13.3	11.	12.5	3.	4.
4 1/4	4 1/4	4 1/4	4 1/4	10.	11.5	10.3	12.3	11.	12.5	3.5	4.4

that they have bought out the entire plant of the Perin & Gaff Mfg. Company, Jeffersonville, Ind., for the manufacture of Butts, and will be ready on this line of goods about January 1. Their new catalogue is in the printers' hands, and they expect to issue it about February 1. It will contain about 150 pages of new goods in Cast Iron, Brass and Bronze Metal.

The Rogers Fence Company, Springfield, Ohio, issue circulars describing their Superior and Splendid Lawn Mowers. The latter is a wood roller machine put on the market, it is intimated, in order to meet the desires of the trade for such a Mower.

The National Cash Register Company, Dayton, Ohio, issue a number of circulars relating to their Cash Register and forcibly representing its utility and advantages. One of these gives an extended list showing the company's shipments for November, and also the names of parties in all parts of the country who are using the Register.

Uriah B. Winchell has withdrawn from the Oak Hill Mfg. Company, and the partners are now N. C. Whitcomb, H. Dietz and Frank Whitcomb, who will continue the business as before.

The Powell Tool Company, Cleveland, Ohio, advise us that they have appointed J. C. McCarty & Co., 97 Chambers street, New York, their agents for the sale of their goods in the Eastern and Southern States, New York City and the export trade. The company also say that they will carry with them a stock of their Axes, Hatchets, Broad Axes, Bench Axes, Adzes, &c., for the accommodation of city and export buyers.

The illustrated catalogue of the Chicago Stamping Company, Chicago, Ill., together with the price lists relating to the goods contained in it, represent fully and attractively the line of Stamped, Japanned and Plain Tinware, House Furnishing Goods, &c., of which they are manufacturers, together with Tinners' Trimmings, Granite Iron Ware, Wire Goods, Tinners' Machines, &c. The catalogue gives copious illustra-

tions of the different articles, and in connection with the list prices furnished in the supplements will be of service to the trade.

The Thomas Mfg. Company, Springfield, Ohio, have issued their catalogue for the coming year for the Thomas Pumps and also for the Royal Lawn Mower, which they are making, and to each of these lines a pamphlet is devoted. The Lawn Mower is also described in a unique and attractive circular. The pamphlet relating to the Mower goes fully into its construction and advantages, alluding especially to its success the past season, and giving a number of testimonials from houses who have used it.

Charles C. Lewis, of New London, Conn. will open, January 10, at Nos. 30 and 32 Lyman street, Springfield, Mass., a line of Carriage-Makers' Supplies, and also Iron and Steel for wholesale and retail trade. Charles E. Merriam, who is referred to as well known by the carriage-makers in New England, will represent him on the road.

The circular and almanac of the Syracuse Chilled Plow Company, Syracuse, N. Y., for the current year illustrate the line of goods they are making, with reference to their special features and list prices.

J. W. Bookwalter & Co., Springfield, Ohio, are putting on the market for the coming season the Favorite Lawn Mower, which is illustrated in an attractive card which has recently been issued. It represents the mechanism of the Mower, and alludes to some of the advantages claimed for it.

The Pope Mfg. Company, Boston, Mass., issue an exceedingly attractive calendar for 1887, which relates to cycling in general, with a special reference to the Columbia Bicycles and Tricycles, of which they are the manufacturers. The calendar proper consists of a pad with a page devoted to each day in the year, giving a mass of matter relating to cycling, including extracts from poems, wheeling statistics, testimonials from practical wheelmen and professional gentlemen, opinions of medical authorities and a variety of miscellaneous information of

## NUTS.

Manufacturers' Standard List, December 9, 1886.

Size.				Hot Pressed.		Cold Punched.	
Width.	Thick.	Hole.	Bolt.	Square.	Hexagon.	Square.	Hexagon.
1/2	1/2	1/2	1/2	13.	20.	13.8	22.
3/8	3/8	3/8	3/8	11.5	16.	12.3	17.5
1/4	1/4	1/4	1/4	10.	13.	10.8	13.8
5/16	5/16	5/16	5/16	9.	11.2	9.6	11.8
3/16	3/16	3/16	3/16	9.	11.2	9.6	11.8
1/8	1/8	1/8	1/8	8.7	10.5	9.	11.
1 1/8	1 1/8	1 1/8	1 1/8	8.5	10.3	8.8	10.6
1 1/4	1 1/4	1 1/4	1 1/4	8.5	10.3	8.8	10.6
1 1/2	1 1/2	1 1/2	1 1/2	8.3	9.8	8.5	10.1
1 3/4	1 3/4	1 3/4	1 3/4	8.3	9.8	8.5	10.1
2	2	2	2	8.3	9.8	8.5	10.1
2 1/4	2 1/4	2 1/4	2 1/4	8.	9.5	8.2	9.7
2 1/2	2 1/2	2 1/2	2 1/2	8.	9.5	8.2	9.7
2 3/4	2 3/4	2 3/4	2 3/4	8.	9.5	8.2	9.7
3	3	3	3	8.	9.5	8.2	9.7
3 1/4	3 1/4	3 1/4	3 1/4	8.	9.5	8.2	9.7
3 1/2	3 1/2	3 1/2	3 1/2	8.	9.5	8.2	9.7
3 3/4	3 3/4	3 3/4	3 3/4	8.	9.5	8.2	9.7
4	4	4	4	8.	9.5	8.2	9.7
4 1/4	4 1/4	4 1/4	4 1/4	8.	9.5	8.2	9.7
4 1/2	4 1/2	4 1/2	4 1/2	8.	9.5	8.2	9.7
4 3/4	4 3/4	4 3/4	4 3/4	8.	9.5	8.2	9.7
5	5	5	5	8.	9.5	8.2	9.7

especial interest to cyclists. The calendar is mounted upon cardboard, which is an artistic and effective piece of work in chromolithography. It is a unique and interesting calendar.

The Weir Plow Company, Monmouth, Ill., denying a report that they are going out of business, announce that they intend to continue in the Plow trade, and allude to the line of their manufactures with reference to some of their special features.

Our readers will observe the Special Notice on page 15, signed "Founder," in which the advertisers intimate their desire for increased capital, and allude to the advantages of an investment in their business. We would say that the concern are well-known manufacturers of Philadelphia, and the opportunity is probably worthy the attention of those desiring such an investment.

The Briggs & Enoch Mfg. Company, Rockford, Ill., December 1 changed their corporate name to the Rockford Plow Company, mentioning as the reason for the change that they have been long known as the Rockford Plow Works, and their goods as the Rockford Plows, Planters, &c. The officers of the company remain the same. It is intimated that they will soon issue their spring circular and price list. Communications may be addressed to them at Rockford, Ill., or to the Geo. K. Oiler Mfg. Company, St. Louis, Mo.

The Arc Scale Mfg. Company, Davenport, Iowa, will in future furnish their Little Wonder Postal Scale nickel plated, thus adding to its appearance and desirability.

The following card was issued by the A. F. Shapleigh & Cantwell Hardware Company, St. Louis, Mo., under date December 12:

To the Public: We desire to correct several statements made in the morning issue of the papers in regard to the condition of our building previous to the fire, in order to place ourselves right and show that the accident was not due in any way to carelessness on the part of the management of the company.

The buildings occupied by us were erected in 1851, and the one numbered 414 was



taken by us at that time. Later we acquired the adjoining buildings to the north. These buildings at the time of their construction were regarded as strong as they could be made, and we have always so considered them.

In defense of our belief we can state that at many times during the past 35 years the stock has been much greater in weight than it was yesterday. At the time we took Nos. 418 and 420 the buildings were thoroughly overhauled and inspected by H. Clay Sexton, then chief of the Fire Department, and by James McGrath, architect.

To make assurance doubly sure, several thousand dollars were expended in putting in extra iron pillars from cellar to roof and in strengthening them generally.

When this work was completed the house was pronounced absolutely safe by the above-named gentlemen.

In addition we wish to say that numerous inspections have been made by the insurance men at least five or six times a year, and the risk has always been classed A 1.

An agent of a New York company had been through the building less than a week ago and desired to write a risk.

We state these facts, as we think, in justice to the company, that they should be made public.

They also announce that they have made arrangements by which they can furnish goods as usual, with prompt shipment. Their new location will be announced in a few days, their office for the present being over the Merchants' National Bank, Third and Locust streets.

The catalogue of E. S. & F. Bateman, Spring Mills, N. J., illustrates the line of Iron Age Cultivator and Horse Hoes, Teeth, Points, &c., which they are making. It is, we are informed, just 50 years since these works were established. Stephen Bateman, of Naugatuck, Conn., in connection with Philadelphia parties having established at Spring Mills, N. J., works for the manufacture of Steel Hay and Manure Forks under the Goodyear patent, being one of the first concerns in the country to manufacture this line of goods in steel. The works passed through a number of changes in the line of goods manufactured until they came into the hands of the present proprietors, who established a line of Cultivating Implements, prominent among which is the Iron Age Cultivator and Horse Hoe, the original, it is claimed, of this class of implements. Its popularity is alluded to as established and increasing, the demand for it coming not only from the United States, but also from abroad. With its varied attachments it is adapted to a wide range of usefulness. While the Iron Age Cultivator is their specialty, they also manufacture a line consisting of Harrows, both one and two horse, the Gem of the Garden, which is referred to as a valuable hand tool, particularly adapted to the requirements of mechanical gardeners, transplanting tools, Hand Plows, Corn Knives, Lard, Wine and Cider Presses combined, Barrel Trucks and Hand Carts, &c. A prominent feature of their business is furnishing in quantities Points and Steels for their Cultivators, as well as to pattern for other implements requiring them.

The Dayton Mfg. Company, Dayton, Ohio, manufacturers and dealers in Furnishings for railroad cars, issue an attractive pamphlet containing advance sheets from their forthcoming catalogue, giving illustrations of various styles of Lamps, Headlights, &c., together with descriptive texts and miscellaneous tables, affording information relating to their manufactures in this department. They also announce that they are prepared to furnish to carbuilders and others everything used in the construction of railway carriages of every kind. They direct special attention to some improvements in Car Lamps, alluding especially to an improved patent Car Chandelier, which has a new coupling device, which is so constructed as to allow the oil fount to be lowered a suitable distance from the lamp frame, and there automatically secured for the purpose of removing the chimneys, thus obviating the necessity of taking down the oil fount, and providing a support for the chimney on the lamp frame when removed from the burner.

In response to the call which was referred to in our last issue for a meeting last Saturday of the Hardware Board of Trade, to take action with reference to modifications in the classification of freights, but few Hardwaremen appeared and nothing was done.

It is reported that C. L. Jeffords, of Jamestown, N. Y., has arranged with Birmingham, Ala., capitalists to start an Axe and Pick factory at the last named place, work to begin immediately.

The George K. Oylor Mfg. Company, St. Louis, Mo., announce that they have contracted for the sale of the goods made by the Nashville Plow Company, Nashville, Tenn., of which they will carry a stock at their warehouse, and intimation is given also that low prices will be made.

Our readers will observe the advertisement on page 30, in which Wyman & Gordon, Worcester, Mass., call attention to their facilities for executing Drop Forgings, including especially to the work for Bicycles, Guns, Agricultural Implements, &c.

#### WHAT THE TRADE SAY.

We have received the following forcible and emphatic communication from a responsible Hardwareman doing both a jobbing and retail business, and we commend its suggestions to the attention of our readers,

relating as it does to an annoying, unbusinesslike and much too frequent practice. There ought to be a reform in this matter. It is not unlikely while some of the trade deserve the castigation which is given them in our correspondent's letter that some of them have fallen into the practice through carelessness or ignorance, and in such cases a little reflection will convince them doubtless of the desirability of discontinuing it. There are many houses among the sellers of goods in which such deductions are not permitted, by whom the uncurrent check on the local bank is returned, or the purchaser charged with the expense of collecting. But with the stress of existing competition many merchants would pocket the trifling loss rather than run the risk of displeasing a customer. Our readers, however, will agree with us that nothing is gained by such smallness in business, and Hardwaremen should be above such practices. We should like to hear from the trade on the subject. Our correspondent says:

The first of January is close at hand—the period of good resolutions and yearly balances—the time when the business man sums up the results of the year and casts about, seeking by what means he may better results next year. There is a class of men, usually unsuccessful, to whose careful consideration I want to present a good resolution, which if carefully followed, I am confident, will go far toward putting them on the road to better fortune. This is the class of tradesmen who pay their bills by their personal checks on their local banks, or who wait to be drawn upon and then refuse to pay exchange, perhaps after asking the bank to hold the draft a week for their accommodation. These men are sneak thieves in the trade. Of course they know that merchandise bills are payable at the time when due, and at the place where the goods were bought. They have been told this a thousand times, and when they seek to pay their bills by local checks which cost their creditor 25 cents or more each to collect, or repudiate the exchange on the draft, they commit a petty theft which they hope may be passed over because of its very pettiness, and consider themselves sharp fellows because of their small rascality. Generally the swindle is passed over with a silent curse at the fellow's meanness, but the sneak thief is greatly mistaken in thinking he has made 25 cents by his sharp trick. To say nothing of the contempt with which he is regarded by his creditor, he has lost many times the amount in financial standing, and his creditor will generally get back at him in ways well known to the jobbing trade, with good interest. No honorable business man ever practiced this small swindle. Few successful men ever did. The cost is too great. Let these persons then take this good resolution as the first step toward more satisfactory results in future: "I will pay my bills at the time when and place where due, or, if unable to do that and my creditor is obliged to make drafts on me, I will meet his drafts as soon as possible, paying all legitimate bank charges." **PROSPERITY.**

A well-known Tack manufacturer, after referring to the fact that the article in our last issue in regard to Tacks represents the condition of the market in accordance with his views, goes on to say:

We think you are right in your ideas of slightly higher prices for Tacks. It does not seem possible that the manufacturers will be willing to continue a losing business when it is all their fault. Tacks to bring anything like a fair return should bring 25 per cent. more than they do today.

Your articles on light weight goods have set the trade to thinking, and those who have resorted to this means of getting trade will soon be compelled to abandon it. When this is done prices will advance. We had no idea of the extent to which the practice was carried, but we have on our desks samples of some of the leading makers' Tacks which run from 15 to 40 per cent. short both in weight and count. The latter has been the favorite method as more likely to deceive and less liable to be detected. We find papers containing 80 Tacks which should contain 115 to 120. This is a thing that is more important to the consumer than weight. It is the same as putting 8d. Nails up and selling them for 3d. Fine. We hope you will not let up on this business.

Referring to some of the dangers connected with coal gas, a correspondent in the vicinity of Chicago writes:

A Chicago paper, under the heading "Three Grown People Asphyxiated," after describing the circumstances, goes on to say: "An examination of the stove showed that the damper in the pipe had been shut off so completely that it was impossible for the smoke or gas to escape in that direction; moreover, the lid on the top of the stove through which the coal is supplied had been left ajar some 2 inches, so that all the gas from the burning coal was emitted into the lungs of the unfortunate trio." This cause of death is becoming very common, too much so. Should not the manufacturers of stoves be held responsible for these mishaps? In machinery of various kinds, and manufactured articles of different kinds, safety guards are placed around them, so that persons using them do not get injured. Let us review the cause of this accident. The stove is described as a combination stove, on which they cooked as well as by which they warmed, probably a heater with oven. The fact that the damper was shut off would not necessarily cause such disastrous results. With my base burner self-feed stove at my residence the damper is turned square across the pipe most of the time during the day, and at night, in addition to this, the check draft is pulled partially out. I know of no damper on the market that is not arranged with a large enough hole or holes to carry off the gas, there also being a space around the damper when in the pipe. Moreover, the lid on the top of the stove had been left ajar some 2 inches. The lid or urn, being only 2 inches ajar,

would not have been as productive of accident as if it were all off. I have tried the experiment repeatedly of turning the urn off a little, when the flame of a lighted match held at this opening would be drawn down toward the magazine. A customer told me last week that when looking at his stove (a round self-feed base-heater, bought of me in the fall of 1885) one morning he found he had left the urn or top turned way off the stove as he had left it, after filling his stove the night before, and not one bit of gas was in the house nor any ill effects resulted from his carelessness. The only conclusion that can be reached in this case is that the stove was either old, with open joints, or the stove was poorly constructed. Probably the latter, because a family are not likely to keep a stove that leaks gas in the day time, as this would if it had been a worn-out stove. If it was a poorly constructed stove, without "gas rings" or some gas-consuming or gas-conducting device, then the makers are responsible. The demand in some sections of the country for cheap "base-burners" is a temptation for the construction of such death traps. The article referred to concludes with the following, which will be of interest: "Death by coal-gas asphyxiation is one of the most horrible that can be imagined, if what expert physicians say is true. They say that the victim, if awake, and it is thought probable that a season of wakefulness occurs in every case, lays perfectly paralyzed in all-aversmental capacity, which is then even quicker and livelier than usual, realizing perfectly well that each additional inhalation is just so much deadly poison, and yet is unable to move as much as a little finger in his or her own behalf." While on the subject of defective or poorly constructed stoves, I heard of this instance from an adjoining place. A gentleman who had used a base burner for five years bought a square "high art" this fall. One night the flame burned up in the magazine, so that in the morning the knight, with lance erect, that had occupied the exalted position on the iron was found prone upon the floor, having melted off. Two nights later the whole top sustained a worse fate, being destroyed by fire burning up in the magazine. Is there not room for improvement?

#### Coal Market.

The demand for Anthracite is pretty active, particularly for Chestnut and Pea, which command nearly, if not quite, the full circular prices. Pea is decidedly strong and said to be wanted beyond the means of supply, reflecting the improvement recently noted through a wide range of industries. Broken is reported weaker. Stocks of Anthracite at shipping points are lower than usual at this season. The probable allotment for January is an interesting subject for conjecture, and surmises are ventured that it will be 2,500,000 tons, but in any case the output will not be restricted to a point below actual requirements. A suspension of work in the mines takes place on Friday until after January 1. Altogether the producers are well satisfied with the situation and the outlook for 1887. The embarrassment long experienced from the scarcity of cars will soon be relieved by additions to the rolling stock. The Reading receivers last week ordered 200, and the Pennsylvania car shops are fully employed. Quotations at New York ports are: Broken White Ash and Pittston, \$3.55 @ \$3.75; Egg, \$3.80 @ \$4; Stove, \$4.15 @ \$4.20; Chestnut, \$3.80 @ \$3.85; Pea, \$2.20 @ \$2.30. Bituminous Coal readily brings \$3.25. The proposed Coal pool hangs fire. Western operators claim that they are getting an advance of 25¢.

In the case of Pennsylvania against the Coal pool, before Attorney-General Cassidy, the principal witnesses thus far examined are President Harris and President Roberts.

The total amount of Anthracite Coal sent to market for the week was 664,303 tons, compared with 753,666 tons in the corresponding week last year. The total amount of Anthracite mined is 30,827,044 tons, compared with 30,274,656 tons for the same period last year.

#### Detroit.

CHARLES HIMMEL & Co., dealers in Pig Iron, Detroit, Mich., report, under date of December 20, as follows: The market continues to gain in strength, and activity has become somewhat greater than during the first part of this month, and at the same time furnacemen are loth to contract except for small amounts, and then only for prompt delivery, and many have sold all their present make and are unwilling to sell at present for the only time they can deliver, namely, in the future. The sellers' ideas have been very generally accepted by the buyers, who co-operate with them, and usually buy quickly if the price is anything like a fair one, knowing the danger of delay. Old Material continues very scarce, particularly Old Wheels, and the wheel-makers seem to demand a much larger lot of Old Wheels than formerly, and it would seem as if they were absolutely essential in a Wheel mixture as the best Charcoal Iron. No stocks are reported anywhere, although one or two holders have recently sold something like from 5000 to 10,000 tons at present prices. But this has not in any way affected this market yet, and, we think, in proportion to the demand the supply is still so small that it will further strengthen prices. We repeat quotations of a week ago, as follows:

Lake Superior Charcoal, all num.	\$22.00 @ \$23.00
Lake Superior Coke, all Ore.	21.00 @ 22.00
Lake Superior Coke, Cinder Mixed.	19.00 @ 20.00
Standard Ohio Blackband.	21.00 @ 22.00
Southern No. 2.	19.50 @ 20.25
Southern Silvery, Open.	18.00 @ 19.00
Southern Silvery, Close.	17.25 @ 17.75
Jackson County, Ohio, Silvery.	30.00 @ 30.75
American Old Iron Rails.	25.00 @ 26.00
Old Wheels	30.00 @ 31.00

#### Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending December 22, 1886:

Hardware.		Steel.	
Atlas S. S. Co.	Old rails, tons, 332	Abbott Jere & Co.	Wire, coils, 12,587
Baur Von C. M.	Plates, 29	Wire, coils, 12,587	
Baker Hermann & Co.	Boiler tubes, 1425	Wire, coils, 12,587	
Cases, 5	Wrought pipes, 60	Wire, coils, 12,587	
Clark G. A. & Bro.	Angle covers, bbls., 55	Wire, coils, 12,587	
Dolge Alfred.	Angle groups, bbls., 55	Wire, coils, 12,587	
Field Alfred & Co.	Castings, 5	Wire, coils, 12,587	
Gorham Mfg. Co.	Double-headed rails, 560	Wire, coils, 12,587	
Case, 1	Wire rods, bbls., 458	Wire, coils, 12,587	
Graef Cutlery Co.		Wire, coils, 12,587	
Morse, cs., 9		Wire, coils, 12,587	
Hammacher, Schlemmer & Co.		Wire, coils, 12,587	
Nails, cs., 38		Wire, coils, 12,587	
Hart O. H. & Co.		Wire, coils, 12,587	
Mach'y cs., 11		Wire, coils, 12,587	
Kaslof		Wire, coils, 12,587	
Cutlery, cs., 6		Wire, coils, 12,587	
Kimney Tobacco Co.		Wire, coils, 12,587	
Machine knives, cs., 12		Wire, coils, 12,587	
Lalor & Grosjean Mfg. Co.		Wire, coils, 12,587	
Morse, cs., 2		Wire, coils, 12,587	
Pioneer Iron Works.		Wire, coils, 12,587	
Sachs & Richmond.		Wire, coils, 12,587	
Nails, kegs, 30		Wire, coils, 12,587	
Taylor Thos.		Wire, coils, 12,587	
Cases, 19		Wire, coils, 12,587	
Wieland & Hilger.		Wire, coils, 12,587	
Morse, cs., 30		Wire, coils, 12,587	
Witte John G. & Bro.		Wire, coils, 12,587	
Cutlery, cs., 3		Wire, coils, 12,587	
Order.		Wire, coils, 12,587	
Cases, 3		Wire, coils, 12,587	
Files, cs., 16		Wire, coils, 12,587	
Mach'y, cs., 29		Wire, coils, 12,587	
Mach'y, cs., 1		Wire, coils, 12,587	
Iron.		Metals.	
Abbott Jere & Co.	Rods, coils, 12,022	Amawick G. & Co.	Old metal, tons, 134
Atlas S. S. Co.	Hoop iron, bbls., 10	Atlas S. S. Co.	Old metal, tons, 134
Baring Bros. & Co.	Wire rods, coils, 997	Central Stamping Co.	Tin plates, bxs., 10
Crocker Bros.	Tubes, cs., 3	City Sheet Works.	Tin plates, bxs., 12
Pig, tons, 400	Old springs, tons, 82	Sheet zinc, cs., 41	Tin plates, bxs., 12
Ferro Iron, cs., 35	Strips, cs., 22	Montell F. T. & Sons.	Yel. metal, bbls., 3
Coddington T. B. & Co.	Blooms, tons, 2000	Pfizer Chas. & Co.	Bismuth metal, cs., 8
Shedden, bbls., 378		Phelps, Dodge & Co.	Black plates, bxs., 70
Henderson Bros.		Order.	Tin plates, bxs., 2180
Pig, tons, 100		Tin plates, bxs., 2180	Tin plates, bxs., 2180
Mason John W. & Co.	Wire rope, coil, 1	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Naylor & Co.	Rods, coils, 9682	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Paulsen W.	Sheets, cs., 9	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Pim, Forward & Co.	Scrap, tons, 800	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Williams, J. & Co.	Castings, 211	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Pig, tons, 300	Steel, cs., 19	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Ward Jas. E. & Co.	Yel. metal, bbls., 3	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Scrap, tons, 800	Phelps, Dodge & Co.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Williams, J. & Co.	Black plates, bxs., 70	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Pig, tons, 100	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Western Union Tel. Co.	Tel. cable drums, 5	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Iron spind, 1	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Pig, tons, 100	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Spiegel, tons, 1080	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Old flange rails, 3027	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
One, tons, 885	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Rings, bbls., 10	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180
Rollers, 18	Order.	Tin plates, bxs., 2180	Tin plates, bxs., 2180

The imports of Cutlery, Hardware and Metals at this port during the week ending December 17 are as follows:

Quantity.	Value.
Brass goods, 35	\$3,460
Bronzes, 32	3,227
Chains and anchors, 28	1,305
Copper, 41	5,078
Cutlery, 119	31,112
Dutch metal, 61	6,130
Guns, 22	9,248
Hardware, 5	819
Iron, pig, tons, 250	2,720
Iron, sheet, tons, 59	2,721
Iron, spiegel, tons, 2,078	45,940
Iron ore, tons, 1,400	2,354
Iron, other, tons, 3,696	28,282
Machinery, 130	8,191
Metal goods, 606	31,099
Needles, 14	4,105
Nickel, 35	4,921
Old metal, 1	5,098
Plumbers, 4	12,561
Percussion caps, 15	2,141
Pins, 12	735
Regulus antimony, 68	3,085
Saddlery, 21	2,560
Steel, 25,001	51,620
Spelter, 110,350	3,255
Tin, bbs., 49,781	197,878
Tin, slabs, 3,694	235,738
Quicksilver, 731	25,194
Wire, 9	2,137

The American Tube and Iron Company, of Middletown, Pa., have issued a new edition of their "Red Book." The book is a neatly-bound volume containing some 75 pages. In presenting the revised edition to the trade the American Tube and Iron Company call special attention to the complete price list, telegraph and cable codes, tables of dimensions, &c., all classes of Wrought-Iron Pipe and Tube, also tables of useful information for boiler-makers and engineers and the trade at large. The company announce that they are prepared to manufacture any and all classes of specialties embraced in Wrought-Iron and Steel Tubing. They carry large stocks of regular standard goods at their mills and also at warehouses in New York and Chicago, and are thus prepared to fill all orders promptly.

The Magnesia Sectional Covering Company, No. 9 North Fifth street, Philadelphia, have perfected their pipe and boiler covering and are now in position to meet the increasing demand. This particular branch is assuming quite large proportions throughout the United States, and judging from conversation with them they are receiving their share of the general business. It is a well-known fact that woodwork, &c., that comes into contact with hot-air pipes is the cause of many mysterious fires. The object of the covering is to prevent these accidents. The manufacturers claim that pipes covered with their magnesia covering can in no way be the direct or indirect cause of fire to inflammable matter of any description in the vicinity of the hot-air pipes. Their magnesia covering is made in the form of hollow cylinders divided longitudinally and jacketed with canvas or other suitable material, and may be rapidly applied by simply closing around the pipe and securing with the metallic bands which accompany each section. Special shapes are made for tees, sills, globe-

valves, &c. Messrs. Ledoux & Co., New York, in making their analyses say they arrived at the conclusion that it contained as follows: Asbestos fiber, 6.84; pure carbonate of magnesia, 87.83; other mineral matter and moisture, 5.33—100.00. They further say that the covering is neither a simply fibrous or simply plastic powder, but a judicious mixture of both.

The Page Belting Company, Concord, N. H., issue a circular descriptive of their Dynamo Belting, with cuts illustrating the manner in which it is sewed, and giving information in regard to its advantages.

#### Exports.

The following table presents the exports of Hardware, Iron, Steel, Metals, &c., from the port of New York, for the week ending December 21, 1886:

Quan. Val.	Quan. Val.	Quan. Val.	Quan. Val.
<b>Dutch West Indies.</b>		<b>Havre.</b>	
Hdw., cs., 2	19	Saddlery, cs., 46	843
Nails, cs., 3	39	Ag. imp., pkgs, 6	700
<b>Copenhagen.</b>		<b>British Australia.</b>	
Mf. iron, pkgs, 11	340	Hdw., cs., 636	17,136
<b>Bremen.</b>		Wampers, cs., 29	3,336
Cyl. bars, 170	2,668	Saws, cs., 25	415
Ag. imp., pkgs, 2	111	Nails, cs., 28	535
Guns, case, 1	50	Sew. ma., cs., 74	1,425
Mf. iron, pkgs, 32	58	Firearms, cs., 4	392
Hdw., cs., 7	271	Clocks, kegs, 45	163
<b>Rotterdam.</b>		Steel, bbls., 12	20
Ag. imp., pkgs, 5	59	Cartridges, cs., 41	897
Hdw., cs., 24	559	Mach'y, cs., 28	5,325
Boilers, cs., 2	611	Mf. iron, cs., 318	3,900
Firearms, cs., 1	134	Ag. imp., pkgs, 95	2,775
Clocks, cs., 2	72	Tinware, case, 1	14
<b>Hamburg.</b>		Jacks, cs., 6	73
Hdw., cs., 115	2,564	Clocks, cs., 69	2,100
Copper, cs., 2	250	Carriage, cs., 1	1
Clocks, cs., 65	2,444	shells, case, 1	1
Ag. imp., pkgs, 46	1,146	Eyeteils, case, 1	75
Mf. iron, pkgs, 8	274	Ag. imp., case, 1	27
Pumps, pkgs, 4	194	<b>Naples.</b>	
Mach'y, pkgs, 8	747	Hdw., pkgs., 46	850
Cutlery, case, 1	904	Shot, sacks, 25	164
Sew. ma., cs., 411	7,804	Nails, kegs, 47	108
<b>Amsterdam.</b>		Tinware, case, 1	40
Mach'y, pkgs, 4	40	Saw, case, 1	18
Hdw., cs., 44	702	Saw, case, 1	18
<b>Danish West Indies.</b>		Carriage, cs., 1	38
Mf. iron, pkgs, 25	799	Tacks, kegs, 3	38
Nails, kegs, 30	80	Mach'y, pkgs, 19	1,738
Mach'y, pkgs, 3	56	Mf. iron, pkgs, 98	1,026
Ag. imp., pkgs, 17	368	Cutlery, cs., 20	563
Steel, bars, 30	16	Sew. ma., cs., 14	328
Nails, bbs., 6	23	Ag. imp., pkgs, 4	141
Cutlery, case, 1	12	Clocks, cs., 4	169
<b>Liverpool.</b>		Tacks, cs., 10	35
Hdw., cs., 23	8,233	Firearms, case, 1	175
Sew. ma., cs., 183	5,547	Tin plates, bxs, 45	178
Mach'y, pkgs, 12	690	<b>Haiti.</b>	
Brass goods, 7	484	Copper tubes, case, 1	91
Saws, cs., 15	166	Nails, kegs, 86	222
Clocks, cs., 12	2,650	Anchor, cs., 1	27
Ag. imp., pkgs, 33	727	Mf. iron, pkgs, 13	148
Firearms, cs., 2	409	Sew. ma., cs., 4	89
Zinc, bbls., 15	669	Hdw., pkgs, 34	445
<b>Hull.</b>		Saws, case, 1	13
Ag. imp., pkgs, 3	85	<b>Venezuela.</b>	
Copper pkgs, 18	2,250	Hdw., cs., 8	25
Hdw., cs., 38	643	Clocks, case, 1	25
Saws, cs., 8	127	Tinware, case, 1	11
<b>Bristol.</b>		Brass goods, 7	484
Hdw., cs., 11	216	Clocks, cs., 9	172
<b>Glasgow.</b>		Pumps, pkgs, 1	18
Ag. imp., pkgs, 83	962	<b>Barcelona.</b>	
Clocks, cs., 19	1,551	Hdw., cs., 16	185
Steel pkgs., cs., 2	127	Clocks, case, 1	15
Sew. ma., cs., 4	650	<b>United States of</b>	
Hdw., cs., 11	157	Mf. iron, pkgs, 349	2,173
Mf. iron, pkgs, 8	300	Cutlery, cs., 86	458
<b>Marseilles.</b>		Sew. ma., cs., 39	847
Clocks, cs., 2	120	Nails, cs., 24	445
<b>London.</b>		Tinware, cs., 27	405
Cartridges, cs., 94	531	Saws, cs., 4	67
Crined shells, case, 1	74	Mf. copper, cs., 18	8,815
Sew. ma., cs., 439	15,501	Clocks, cs., 20	972
Mach'y, pkgs, 129	10,756	Nails, kegs, 121	298
Ag. imp., pkgs, 18	177	Boiler, cs., 1	206
Mf. iron, pkgs, 12	174	Ag. imp., pkgs, 4	45
Saws, cs., 2	65	Brass, case, 1	72
Copper pans, cs., 4	487	Cartridges, cs., 135	798
Cutlery, case, 1	13	Steel tubes, 10	250
Clocks, cs., 173	3,660	Cartridges, cs., 4	519
Hdw., cs., 628	13,973	Iron chains, cs., 2	88
Wire rope, 4	1,515	casks, 2	88
Wingers, cs., 18	2,250	Nails, pkgs., 116	2,754
Copper, cs., 18	2,315	Mach'y, pkgs, 78	4,458
<b>Puerto Possessions</b>		Cutlery, case, 1	127
Hdw., cs., 265	8,575	Zinc drums, 5	240
<b>Canada.</b>		Lead and mfa. of, pkgs, 5	134
Tin plates, bxs, 70	300	Bab. met., case, 1	30
Wire, cs., 1	113	<b>Azores.</b>	
<b>British West Indies.</b>		Hdw., case, 1	30
Mf. iron, pkgs, 7	84	<b>Ecuador.</b>	
Ag. imp., pkgs, 15	75	Hdw., pkgs., 267	1,789
Mf. iron, pkgs, 11	69	Mf. iron, pkgs, 284	1,960
Hdw., cs., 4	23	Soles, cs., 2	102
Nails, kegs, 14	42	Cutlery, cs., 8	15
Sew. ma., cs., 1	38	Mach'y, pkgs, 2	404
<b>Nova Scotia.</b>		Water-closets, cs., 1	18
Brass gds, case, 1	30	Clocks, cs., 10	128
<b>Newfoundland.</b>		<b>Brazil.</b>	
Hdw., cs., 2	21	Cartridges, cs., 14	318
<b>New Brunswick.</b>		Clocks, cs., 79	828
Tin crystals, keg, 1	48	Cutlery, cs., 50	612
Pumps, pkgs, 2	179	Nails, cs., 19	361
<b>Cuba.</b>		Firearms, cs., 15	1,565
Mach'y, pkgs, 584	22,468	Nails, cs., 66	420
Tinfol, cs., 8	160	Ag. imp., pkgs, 69	841
Mf. iron, pkgs, 328	2,392	Tinware, cs., 11	258
Arms, case, 1	25	Mf. iron, pkgs, 318	1,924
Boiler tubes, 148	451	Mach'y, pkgs, 24	1,818
Tacks, cs., 3	49	Tacks, bxs, 159	1,622
Water-closets, cs., 1	104	Hdw., cs., 609	7,075
Cutlery, cs., 196	2,768	Sew. ma., cs., 45	530
Clocks, case, 1	67	Cutlery, cs., 15	361
Hdw., pkgs, 199	8,763	Cotton gin, cs., 18	573
Saws, cs., 7	40	<b>Argentine Republic.</b>	
Ag. imp., pkgs, 18	371	Ag. imp., cs., 38	8,91
Tinware, cs., 10	155	Clocks, pkgs., 55	992
Cartridges, cs., 1	12	Mach'y, pkgs, 39	1,849
Nails, pkgs, 18	300	Washing ma., 2	15
Saws, cs., 1	31	Car-wheels, 300	925
<b>Hong Kong.</b>		Hdw., cs., 11	188
Pumps, pkgs, 4	185	Sew. ma., cs., 199	3,469
Clocks, cs., 20	369	Pumps, cs., 8	461
Ag. imp., pkgs, 7	210	Cutlery, cs., 15	361
Clocks, cs., 11	165	Guns, cs., 2	722
Hdw., case, 2	447	<b>Philippine Islands.</b>	
Mf. iron, cs., 15	340	Hdw., cs., 11	278
<b>China.</b>		Ag. imp., pkgs, 7	71
Ag. imp., pkgs, 18	110	<b>Palermo.</b>	
Firearms, cs., 8	110	Hdw., case, 1	42
Hdw., cs., 7	180	Sew. ma., case, 1	25
Wingers, case, 1	193	Nails, kegs., 31	105
<b>Japan.</b>		Mf. iron, pkgs, 56	138
Sew. ma., cs., 2	50	Mach'y, pkgs, 8	290
Clocks, cs., 125	3,195	<b>Lisbon.</b>	
Hdw., cs., 124	3,519	Cartridges, case, 1	30
		Ag. imp., pkgs, 177	2,136
		Guns, case, 1	100
		Kut. ma., case, 1	34



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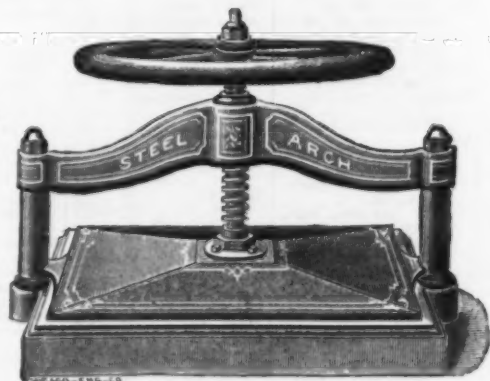
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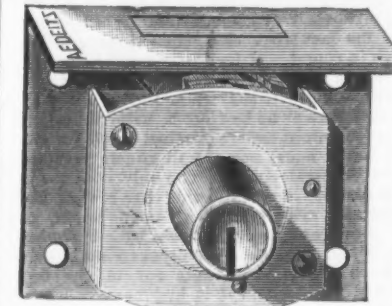
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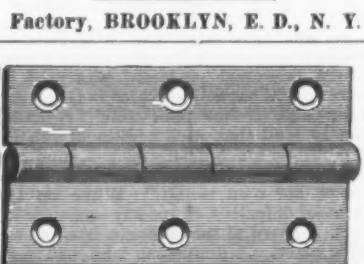
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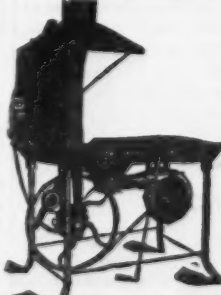
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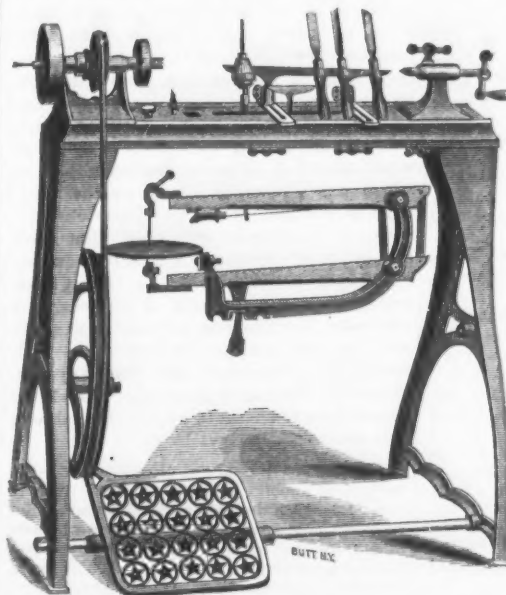
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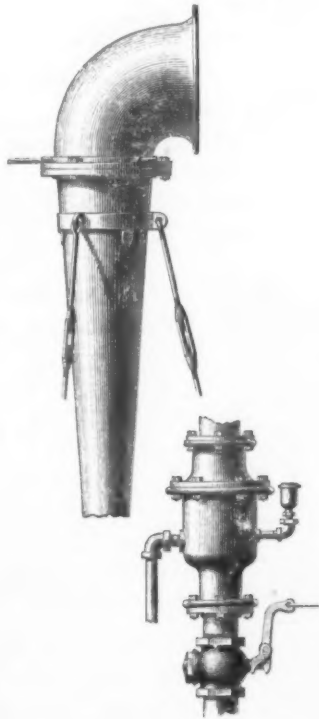


## MECHANICAL.

## Self-Acting Steam Siren.

Messrs. A. & F. Brown (Progress Machine Works), 41 Park place, New York, are putting on the market a new self-acting steam siren specially adapted for use on board of steamers, lightships and men-of-war, for lighthouses, fire-alarm towers, workshops, &c.

The general design and construction of the apparatus will be readily understood from the engravings which we annex, Fig.



Self-Acting Steam Siren, Made by A. & F. Brown, New York.—Fig. 1.—General View.

Fig. 1 representing a general view, and Fig. 2 a longitudinal section. The revolving part of the siren, or siren proper, A, is provided with oblong ports *c* and lateral inclined openings *b*. The siren casing B is furnished with similar ports and openings, the latter, however, as will be understood from the nature of the siren, inclining in the opposite direction. The lower part of the steam chamber C is furnished with a vertical bearing for the siren spindle, a similar bearing

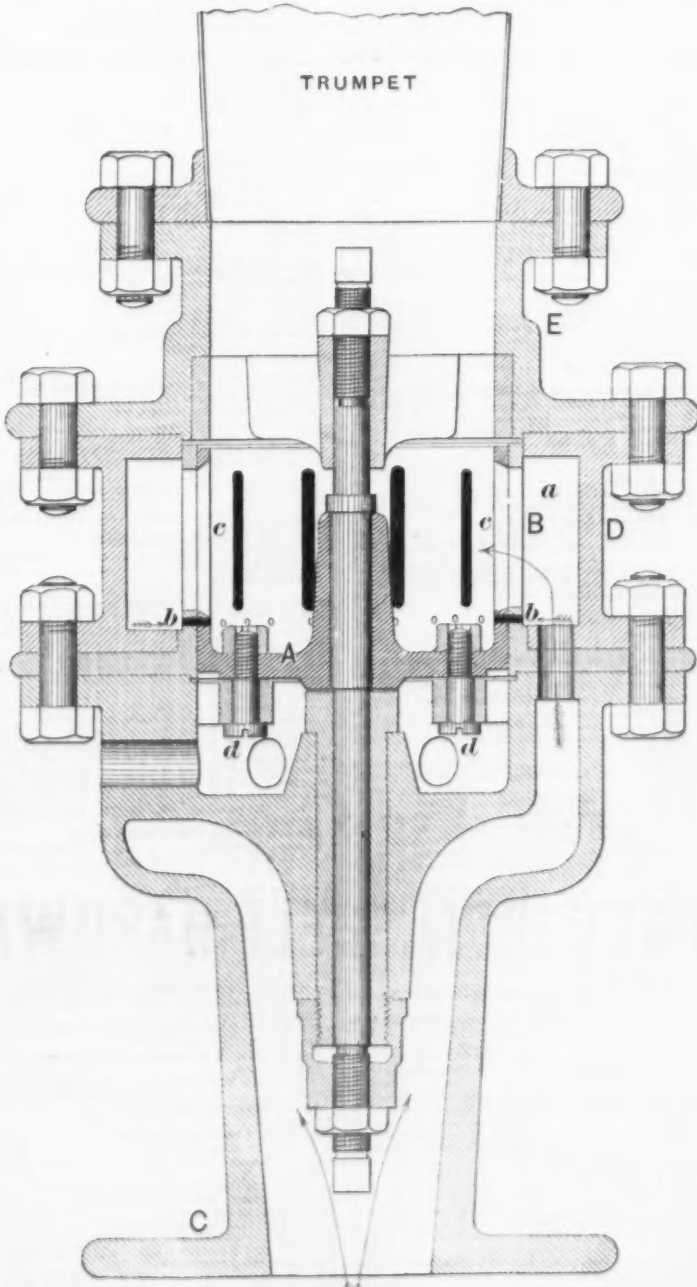


Fig. 2.—Longitudinal Section.

being arranged in the upper chamber E. Steam, being admitted to the chamber C, enters the middle part D, and passing thence through the openings *b* causes rotation of the part A and a series of effluxes and stoppages of steam through the openings *b* and *c*. The resulting vibrations of air, when the successive impulses are sufficiently rapid, produce a sound. The number of

revolutions are kept uniform by two governors attached to the bottom of the siren. The apparatus is furnished with a copper trumpet and brass valve ready to connect to a 2 inch steam-pipe. It has been adopted by the United States Lighthouse Department, the Marine Department of Germany, the North German Lloyd Steamship Company, the Hamburg American Packet Company, the Marine Department of Russia, the Marine Department of Belgium, and a number of other places, and has, we understand, given the greatest satisfaction in every instance.

## Boilers in the Philadelphia Water Department.

Mr. John E. Codman presented at the last meeting of the Engineers Club of Philadelphia an account of the results obtained from the recent tests of the efficiency of different forms of boilers now in use by the Philadelphia Water Department. The boilers first tested were four in number, and known as "double decked," a popular form in Philadelphia, and supposed by many to be an economical steam generator. The lower boiler generally contains about as many tubes as the tube sheet will safely hold; the upper boiler, or drum, is connected to the lower one by two or more necks, and the water is usually carried so as to half fill the upper drum. In the trials mentioned the height of water was measured from the bottom of the upper drum. For 16 hours it was kept at 5 1/2 inches from the bottom, and for 8 hours at 12 1/2 inches from the bottom. This difference is not very great, but the results obtained show the advantage of keeping the water as low as possible in the upper drum, as with high water much that is obtained is only apparent evaporation. An apparent evaporation of 16,000 pounds of water was obtained per hour for the four boilers, which when corrected gave only 16,700 pounds per hour. The calorimetric tests for quality of steam, made at intervals of 30 minutes, gave over 4 per cent. of water in the steam.

With 5 1/2 inches in the upper drum an apparent evaporation of 16,100 pounds was obtained per hour, which, when corrected for steam, &c., gave 17,230 pounds per hour. The calorimetric tests gave 6 1/2 per cent. of water in the steam. The evaporation of water per pound of combustible averaged above 9 1/2 pounds for the 24 hours. Using 3 1/2 pounds of water from and at 212° F. as the equivalent of a horse-power, the low water gives 500 horse-power, against 486 horse-power for the higher water. The coal used was an ordinary quality of Schuylkill pea coal containing about 16 1/2 per cent. of ashes and clinkers. The second tests were made on the ordinary tubular boiler, set in brickwork and externally fired, arranged so that the escaping gases passed over the top of the boiler and around the steam drum. The boilers were run for 24 hours, all water and coal being carefully weighed and

was 10 1/2 pounds of water per pound of combustible. The rated horse power of the boilers was 30 horse-power for each, or 60 horse-power for the two tested. The horse-power developed, using 3 1/2 pounds of water from and at 212° F., was nearly 100 horse-power.

Some discussion followed. President Wash-



Fig. 1.—Side View.

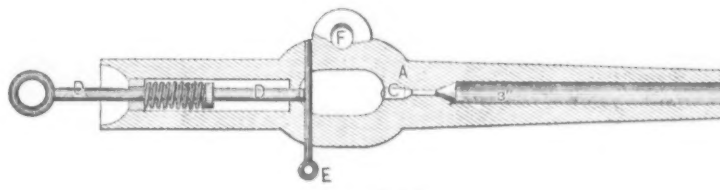


Fig. 2.—Section.

Heaton's Stump Gun, Made by the Bed Rock Emery Works, Bainbridge, N. Y.

ington Jones said: In the so-called "double-decked" boilers the contracted passages or necks connecting the upper and lower sections, and through which the steam formed in the lower section rises to the upper one with such a high velocity as to carry entrained water, which passes to the steam pipe and is credited as steam, unless the calorimeter test reveals its presence. This disposition to carry water is augmented by the increased velocity of the ascending steam, caused by the injudicious crowding of the tubes nearly to the top of the lower section, and by insufficient space between the vertical rows, so that the passageways through the necks are thereby obstructed. The better practice is to omit such tubes as come immediately under the necks, leaving a space of several inches (say one-half the diameter of necks) between the shell and the necks and the adjacent tubes, so as to obtain a more quiet liberation of the steam bubbles. The necks should be of limited diameter, ordinarily from 10 to 14 inches, so that the strength of the shell shall not be impaired by the holes cut in it to match the necks. More than two necks are injurious, as the upper and lower sections should not be rigidly bound together, but should be permitted to alter their parallelism if unequal expansion demands it. The greater quantity of steam formed at the front or furnace end of boiler should establish a circulation upward through the front neck and downward through the back neck. This, however, is evidently not the fact, as the quick and frequent fluctuations of the water line shown by the glass gauge proves. When a volume of steam greater than usual is generated in the front end of boiler, the quickened ascent of the current causes a larger quantity of water to flow through the front neck into the upper section, and the water-line rises momentarily at that end of the section and is so shown by the glass water gauge; meanwhile, the water is passing down the neck at back end. When the ebullition at front end becomes quieter and the upper current slower the water line falls to a level or possibly below it at front end, if the back neck is giving a passage to steam formed at back end of boiler, and so reverses the currents. One requisite of the first importance to the evaporative efficiency of a boiler is the production and maintenance of a constant current of water passing without change of direction over the heated metal surfaces, so as to sweep off the steam bubbles adhering to those plates and bringing into their place fresh particles of water, to be in their turn converted into steam bubbles.

## Gas Engines for Large Power.

The Otto Gas Engine Works, at Deutz, Germany, are busy with large motors of this class for driving mills and factories, instead of the usual steam engine. These gas engines are used in connection with a special gas making plant, and it is stated that, whereas the average consumption of an ordinary steam engine is 3 1/4 pounds of coal per horse-power, the corresponding consumption of the gas engine is only 2 1/4 pounds, and this economy has induced several works to replace their steam engines by large gas engines. Among these works are the zinc-rolling mill of W. Grillo, in Oberhausen, where to gas motors supply an aggregate of 244 horse-power; the Mächern Berg Werk Verein, where seven motors supply an aggregate of 174 horse-power; the Russian company for the manufacture of powder in Schlusburg, where 17 motors supply an aggregate of 194 horse-power; a sugar factory in Elsdorf, where six motors supply an aggregate of 191 horse-power; the water works of the town of Coblenz, with 120 horse power; the municipality of Prague, with 150 horse power, for electric lighting, and the opera in Frankfurt-on-the-Main, with two motors having 100 horse power.

## Heaton's Stump Gun.

We show in two accompanying engravings elevation and section of an ingenious contrivance devised for bursting tree stumps. It has been brought out by Mr. Charles Heaton, of the Bed Rock Emery Works, Bainbridge, N. Y., and is called by him a stump gun.

The cuts clearly show its construction. In using it a 1/2-inch hole is bored into the soundest part of the stump. Then the gun is loaded with from 1 to 2 ounces of powder and lightly wedged; next the gun is screwed into the stump by means of a bar passed through the eye in the center of the gun. The firing pin D is then drawn back and held by the pin E. A blank 1/4 cartridge is inserted at C, while a chain with a heavy block of wood is worked into the eye F. The lanyard having been hooked into the firing pin E, and the operator having placed himself behind any convenient cover, the pin E is withdrawn and the stump has to go. The gun cannot be blown out until the stump bursts and releases it. The screw has four threads to the inch and securely holds the gun in place. With ordinary care

there is no danger in using the stump gun. There is no vexatious delay waiting for the blast; as soon as the line is hauled the stump goes, and the gun can be readily found anchored to its block of wood. The sounder the stump the more certain it is to burst. The gun is sufficiently strong that in falling, even upon a stone, no damage is

late the number of twists or flutes to be cut on the columns. This part can be furnished with a groove of shorter or longer pitch, thus making the twists on columns either shorter or longer, as may be desired. Where straight carving or fluting is desired the guide E is removed from the roller, thus permitting the column to remain stationary. The slide-rest being attached to the bed remains stationary, and the carriage is then propelled backward and forward by the crank handle which is connected with a pinion working in a reciprocating rack attached to the bottom of the carriage. The machine is made in two sizes, one having a carriage 6 feet in length and a roller 2 feet long, thus adapting it for columns of 3 feet and under, and the other with a carriage 8 feet long, with rollers 3 feet long, and adapted for work 4 feet in length.

## Hollow Chisel Mortising Machine.

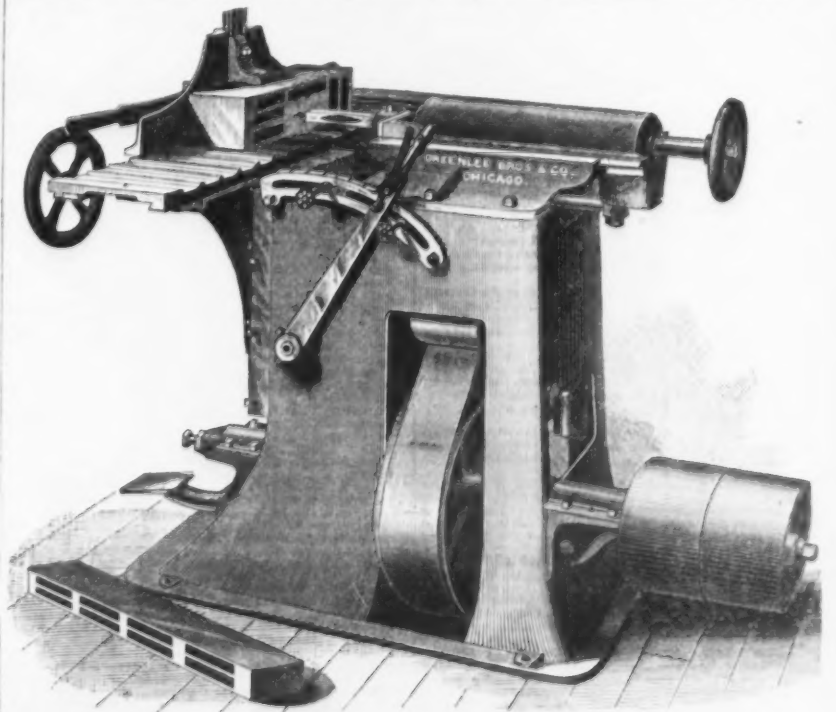
Greenlee Bros. & Co., 329 W. Twelfth street, Chicago, Ill., are building a hollow chisel mortising machine which we illustrate in the accompanying engraving. The process embodied in this machine is said to be entirely original in its application, the machine accomplishing a result in no other way attainable. The work is performed by a hollow chisel, the bit working inside, while in turn the bit prevents the chisel from splitting or shivering the wood outside the mortised space. The machine is said to work with great facility in hardwood as well as soft. It is regularly and uniformly operated by means of stops and lever appliances. The finished mortise can be made in the time ordinarily required in laying out the work. The levers, as will be seen by reference to the engraving, are in handy reach. A single movement in each case is sufficient to throw the table in posi-



Machine for Fluting, Carving and Rope Twist Cutting, Built by Engelmann & Co., Cincinnati, Ohio.

movable tailstock to hold the work to be cut in position. The cutter spindle A moving in the slide rest B can be raised or lowered by the hand lever provided for the purpose, as shown, and will thus accommodate any diameter of column as well as follow the decrease in the diameter of taper columns as the cut proceeds toward the smaller end. In order to prevent the bit from cutting deeper into the wood than is desired a collar is placed on each side of the bit of the proper diameter, so adjusted as to run on the surface of the column. The slide-rest is balanced by the weight G,

tion or to raise or lower the cutting-bed of the machine. The depth of cut and the distance between mortises, perpendicularly or horizontally, are made uniform and are regulated at will by means of stops and other effective mechanism. Mortises can be cut very closely together, even to the extent of leaving a wall of wafer-like thinness as a partition. This wall is not subject to the slightest strain or disturbance, a result to which the manufacturers allude as something not hitherto obtained. The mechanism is so simplified as to require but little attention on the part of



Hollow Chisel Mortising Machine, Built by Greenlee Bros. & Co., Chicago, Ill.

which is attached to swinging and oscillating hangers containing the pulleys, thereby retaining the proper tension on the belts at all times, and following the shape of the columns by a slight pressure on the lever, thus also rendering any adjustment of the belts unnecessary in order to provide for the different diameters of the work to be produced. The slide rest sets in a circular extension with a slot on the back of the bed, so that the rest itself can be adjusted at any angle necessary to cut the required twists. A division plate, C, is used to regu-

the operator, and it reduces his labor to a minimum. There is no downward or pounding motion to jar or strain the machine or to try the muscle or nerves of the operator, who is usually compelled to bear the brunt of the blow with his foot on the treadle. The movement in this case is direct and forward. The machine will mortise 1 1/4 inches square and under to the smallest size required and to any desired depth. In the foreground in the illustration is the representation of a piece of timber which has been mortised by the machine.







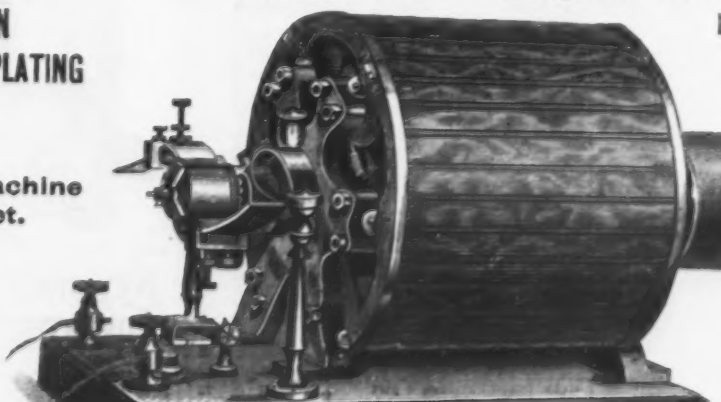
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**Domestic Sash Lock.**

In the cuts herewith are shown two forms of sash locks offered to the trade by B. Gautenberg, of Covington, Ky. The locks are alike in principle, but differ in construction and the manner of applying



Domestic Sash Lock.

The lock consists of a hollow barrel through which a bolt passes. The bolt is forced outward by means of a spiral spring, one end of which rests under the bolt head and the other against the face plate of the barrel. By giving the bolt a quarter-turn when forced into place it is securely locked. By reference to the engravings it will be seen that one style of bolt is intended for inserting through the sash, while the other is provided with a plate for screwing against

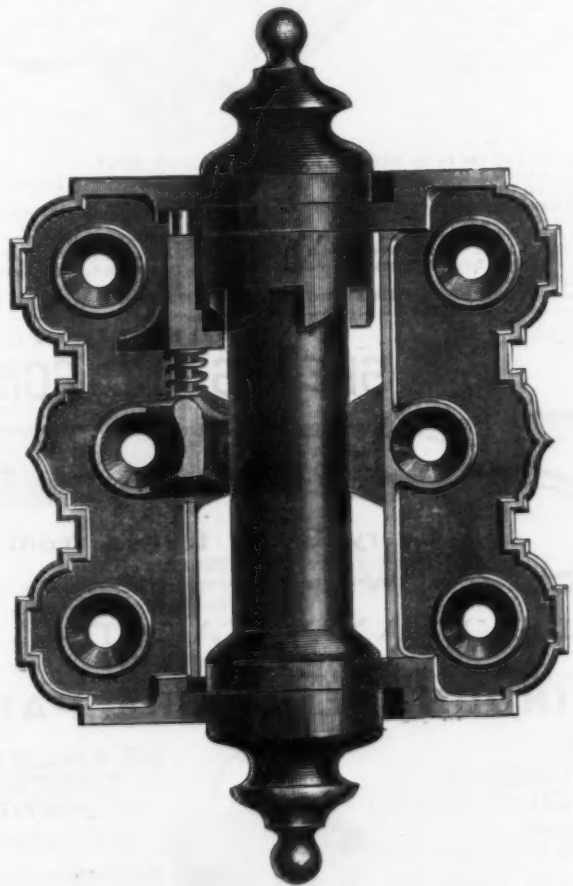


Modified Form Domestic Sash Lock.

the top surface of the sash. The plate which attaches to the upper sash is modified so as to correspond with the difference in construction of the bolt already referred to. The samples which have been submitted are handsomely nickel-plated.

**Loose-Pin Spring Hinge.**

The Ohio Butt Company, of Morris, Ill., with Chicago office at 55 Dearborn street, are putting upon the market a loose pin-spring hinge which, on account of several novel features, is of interest to our readers. Loose-pin spring hinges have been attempted many times in the past, but the present



Loose-Pin Spring Hinge.

article seems to be more of a success than any other which we have had the opportunity of examining. The pin is easily removed, and when this is done the two leaves of the hinge may be readily separated. Accordingly, doors hung with these hinges can be removed with the same facility as if hung with ordinary loose-pin butts. The pin can be removed without danger of loosening or dropping any of the smaller parts of the hinge. The tension ratchet of

springs is of the best quality of steel, tempered expressly for the use to which it is applied. The sample which we have had the pleasure of examining is neatly fitted and seems well adapted in every respect for the use for which it is intended. The makers assure us that they make a specialty with all their goods of careful, painstaking work, subjecting the finished pieces to rigid scrutiny, and packing only such goods as are perfect in every particular.

**Calef Shovels and Spades.**

The Calef Mfg. Company, 293 Broadway, New York, are making a line of shovels and spades, the special features of which are illustrated in the cut which is given below. It will be seen that the teeth are corrugated in the manner somewhat imperfectly indi-



The Calef Shovel.

cated in the illustration. They are also described as tempered, and thus, with the form they are made, are alluded to as the strongest part of the shovel, insuring them from turning, twisting or breaking. They are made in this way so as to secure the greatest cutting or penetrating power with the least expense of labor, and it is claimed that the pointed teeth at once loosen the soil to be worked, while their wedge-like shape permits the shovel or spade to penetrate it with ease. They are alluded to as especially useful in coal yards, gravel pits and stony soils, from the fact that they readily displace stones, coal, gravel and other solid substances without being seriously impeded in their progress through the ground. They are described as made of superior cast steel, and equal in quality to any goods on the market. The company are making something of an assortment of shovels, spades, etc., on the same principle, but their line is not as yet complete.

**Pipe Attachment for Wrenches.**

This is a convenient pocket tool of steel which has been patented by F. A. Seymour, of Detroit, Mich., inventor of the Acme

and passed into the slot and the wrench then so turned as to draw on the end of the chain which is permanently secured to the head. Owing to the cam shape of the head of the attachment such motion of the wrench tightens the chain on the pipe in a manner that will be readily understood. The moderate cost and convenience of this article, and especially its adaptation to a wide range of sizes of pipe, are alluded to.

**MANUFACTURING.****Iron and Steel.**

Jones & Laughlins, Limited, of the American Iron Works, Pittsburgh, are erecting two 10-inch, one 12 inch and one 16-inch roll train, with engines and all other appurtenances belonging thereto, including

a new building. These trains will be devoted to rolling steel shapes, and will have a capacity of about 200 tons per day.

Mr. E. D. Wassell, of Pittsburgh, has been in Sharon, Pa., for some time arranging for a series of experiments in rolling steel by a new process at the works of F. L. Kimberley & Co., Limited, of that place.

The new steam hoist towers of Nos. 4 and 5 furnaces of the Crane Iron Works, at Catawqua, Pa., are being erected. Of the five furnaces now operated by the above company three are running on Bessemer pig and two on foundry iron.

No. 2 Furnace of the Thomas Iron Company, at Hokendauqua, Pa., is undergoing repairs and will be blown in at an early date. Keystone Furnace of the above company, located at Chain Dam, was blown in on the 13th inst. It has had a thorough overhauling.

The Catawqua Dispatch is authority for the statement that some stock of the Bethlehem Iron Company, of Bethlehem, Pa., was sold on the 13th inst. for \$112 per share. The par value of this stock is \$50 per share.

After the first of January the Allentown Rolling Mills, of Allentown, Pa., will pay their employees every two weeks, instead of on the Saturday on or after the 16th of each month, as at present.

The works of the Co-operative Nail Company, at Steubenville, Ohio, are offered for sale. These works were erected during the nail strike last year by a number of nail-workers. They were in operation about three months.

Three of the four blast furnaces operated by the Cleveland Rolling Mill Company, of Cleveland, Ohio, have been compelled to bank down for want of coke.

The Cambria Iron Company, of Johnstown, Pa., by P. C. Chapin, the general manager, have made a proposition to their employees to convert the large mercantile store operated by Wood, Morrell & Co., and known as the company's store, into a co-operative establishment on the following basis: Capital stock \$200,000, in \$10 shares, the subscription books to remain open for 30 days, and no person to take more than 10 shares until after that time, when one person can take not more than 1000. The two weeks' pay adopted by the company and the last proposition are well-received by their employees.

The puddling department of the Hubbard Iron Company's works, at Hubbard, Ohio, has started up on double turn. The 12-inch mill has also resumed operations. Over \$15,000 has lately been spent in improving the plant of the above company, and it is expected it will be run steadily in all departments.

A post office has been established at Duquesne, on the Pittsburgh, Virginia and Charleston Railroad, some 12 miles above Pittsburgh. The necessity for the post office was created by the Duquesne Bessemer Steel Works, now being erected there.

A charter has been granted at Harrisburg to the McKay Mfg. Company, of Pittsburgh. The capital is \$54,000 and is held by James McKay, Richard C. Nugent, Clarence L. Derby, Robert McKay and James McKay, trustee for Albert McKay, all of that city. The company propose to manufacture iron and steel.

The Republic Iron Works, Limited, of Pittsburgh, are making a number of extensive improvements. A large new iron building is now being built, and an entire new puddling department is under construction,



Fig. 1.—Pipe Wrench Attachment.

the hinge is arranged in such a way as to make it a very simple matter to set the hinge to any tension that may be desired. No special tool is necessary, the point of a screw-driver or even a 10d. nail answering every purpose. The third point of novelty, and one also of utility, is the incasing or covering of the spring. The spring is placed inside of a strong metallic tube fitting the spring clutches at either end and forming adequate protection against dust, rust, &c. We are assured by the manufacturers that the wire used in forming the

wrench, and is now put on the market by the Armstrong Mfg. Company, of Bridgeport, Conn. The form of the attachment is represented in Fig. 1, and the manner in which it is applied to the wrench is shown in Fig. 2, which also indicates its use as a pipe wrench. The head of the attachment has a slot at each end, in one of which the chain, as indicated in Fig. 1, is pivoted, while the slot at the other end of the head is of such width as to receive a link of chain when

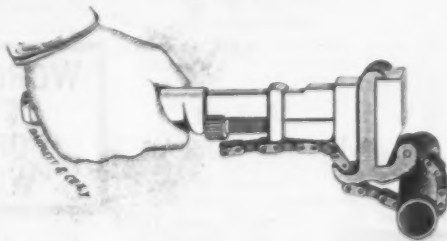


Fig. 2.—Pipe Wrench Attachment in Use.

placed therein with its great diameter parallel to the walls of the slot, but too narrow to receive the chain in the contrary position, so that when placed in it the greater diameter of the chain will come against the under sides of the lugs, so that the chain cannot be drawn through the slot. In use the attachment is placed between the jaws of the wrench, as shown in Fig. 2, and the movable jaw screwed up to hold it in place. When a pipe is to be grasped the toothed portion of the head is placed against the pipe, the free end of the chain drawn around the pipe

Lean & Blair, engineers and contractors, of Pittsburgh, who have recently secured control in the United States for the erection of the Lash patent steel melting furnace, inform us that they have just closed a contract with Everson, Hammond & Co., Limited, of that city, for the building of two of these furnaces, with a capacity of 15 tons each per heat. Work on one of the furnaces has already been commenced. They will be built so as to admit either natural or producer gas for fuel, and will be worked exclusively on soft steel for sheets.

It is reported that a large industrial establishment in Philadelphia will be removed to the South Side of Pittsburgh the coming spring. A tract of land has already been purchased, for which \$33,000 was paid. The name of the concern has not as yet been made public.

The American Tube and Iron Company, of Youngstown, Ohio, and Middletown, Pa., have opened a branch office at 167 First avenue, Pittsburgh.

After January 1, 1887, the interests of Moorhead & Co., proprietors of the Soho Iron Mills, at Pittsburgh, and Moorhead, McCleane & Co., owners of the Soho Furnace, at that place, will be merged into a joint stock company, to be known as the Moorhead-McCleane Company, who will continue the business in all of its branches.

A company has been formed at Birmingham, Ala., for the erection of two more furnaces with Pennsylvania capital. The parties to the transaction are Smith & Eastman, a prominent local firm of land operators, on one side, and several of the gentlemen from Uniontown, Pa. The latter take from Smith & Eastman a half interest in some 2000 acres of iron lands, with mines already opened, and a furnace site consisting of 400 acres near Ironclad, 6 miles east of Birmingham, and obligate themselves to furnish money to build two furnaces as soon as possible. Mr. Thompson, president of the First National Bank of Uniontown, was selected president of the company, and Mr. Hogsett, who has a furnace near Pittsburgh, general manager.

Fayette Brown, receiver of Brown, Bonnell & Co., of Youngstown, Ohio, in his October report states that at the beginning of the month he held a balance of \$62,102.90, and the receipts were \$299,801.72, making a total of \$361,904.63. The disbursements during the month aggregated \$339,572.52, and the balance in the hands of the receiver on October 31 was \$22,332.11.

The new Bessemer steel works which the Tremont Nail Company are erecting at Tremont, Mass., will consist of a building 120 x 60 feet. The roof girders will be of wrought iron and the sides will be of corrugated iron. This will be the steel works proper, and in it will be placed two 3-ton Clapp-Griffiths converters, each capable of turning out from 9 to 12 tons per hour. The rolling trains will be located in the present mill building, which is of wood and is 200 x 300 feet. In this building there will be two nail-plate trains, each of a capacity of 100 tons in 24 hours. There will be also blooming and billet trains of similar capacity, and one or more tack-plate trains for rolling narrow tack plate, each with a capacity of 25 tons per 24 hours.

The Builders' Iron Foundry, of Providence, R. I., are making 16 large piers for use in the Panama Canal work. The piers are made of iron 1 inch thick, and are hollow tubes varying from 8 to 12 feet in diameter. Each section of the piers is upward of 60 feet long.

The Hopkins Bridge Company, of St. Louis, have secured the contract for the erection of several bridges in the extensions of the San Antonio and Arkansas Pass Railway.

The Royersford Iron Foundry Company, Royersford, Pa., have sold the premises to the lessees, Floyd, Wells & Co., for \$8000. The price is considered very low, as the buildings are large. The sale also includes the engine, boiler and machinery.

The Mary Furnace, owned by the Ohio Iron and Steel Company, at Lowellville, Ohio, made last week over 900 tons of foundry iron. Since going into blast, October 25th last, the output has been steadily gaining until it has reached the above figure. The Anna Furnace, at Struthers, operated by the same company in conjunction with Cleveland and Chicago parties, turned out 802½ tons, making a total tonnage of 1706 tons. This product is the largest ever made in the history of either plant. In the case of the Struthers the output is remarkable because the present lining has been in over five years. During this period it remained idle about 20 months, and was started without any repairs, making the best run since she was built.

A syndicate of Atlanta and Richmond capitalists has been formed for the erection of two 150-ton iron furnaces at Oxanna, in the center of the Alabama coal and iron regions, on the crossing of the Georgia Pacific and the East Tennessee roads, adjoining Anviston. These furnaces will cost \$380,000.

It is stated that the Bethlehem Iron Company, Bethlehem, Pa., are erecting a steel plate and shafting mill 650 feet long and 113 feet wide, which will be ready for occupancy in the early part of 1887. The peak of the roof is 85 feet from the floor level. A wing, 91 feet wide and 700 feet long, is to be erected on the north side. No Bessemer steel will be used in the building, all the work being from the open-hearth steel. The company intend to manufacture steel armor plate, and have their eye on ordnance work, especially on the heavy steel forgings required by the United States Government.

A company was recently formed at Sheffield, Ala., to erect a large cast-iron pipe works, nail works, &c. The corporation is to be known as the Sheffield Pipe and Nail Company, and will make cast and wrought iron piping, bolts, nuts, nails, screws and other articles of iron and steel. The company is a strong one, consisting of such men as the Hon. Henry D. Tompkins, of Atlanta, Ga.; Moses Bros., of Montgomery, Ala.; W.

L. Chambers, J. R. Adams and Hon. David Clompton, of Montgomery, and others. The capital is \$100,000.

It is reported that the Alpine Iron and Transportation Company will begin work on their blast furnace at Alpine, Ala., within three months.

**Machinery.**

The Dickson Mfg. Company, of Philadelphia, are erecting at their works at Wilkes-barre, Pa., a 320-horse-power engine for shipment to Yokohama, Japan.

We learn from the Wainwright Mfg. Company, 65 and 67 Oliver street, Boston, and 93 Liberty street, New York, that they have recently received an order from Denmark for their corrugated brass tube radiators.

The Progress Engine and Machine Works, of Summerfield, Md., have recently acquired the sole right to manufacture Kirkwood's wind engine, and have just completed an additional shop for that purpose. They are busily engaged in that department—in fact, behind in their orders. Their automatic engine is meeting with a very favorable reception, and they are now finishing up a lot of some 15 to 20. Besides their automatic engine the works build a plain slide-valve engine of the same general design, substantial and heavy. They also manufacture a line of emery grinders, lathe heads, &c. The shops have been located at Summerfield about one year.

The Murdock Valve Company, of Detroit, Mich., have recently finished a large order of valves for the water works department of Detroit.

The Excelsior Iron Works, of Chicago, are still engaged in preparing the steel plates for the conduit of the North Chicago Cable Road. The process gone through is that of punching, bending in form of a yoke and dipping into a preparation of tar. The company have been turning the plates out at the rate of 10 to 20 tons a day, which is much faster than they could be disposed of by the railroad company.

Byram & Company, of Detroit, Mich., have recently placed large sizes of their Colliery cupolas in the Lafayette Car Works, of Lafayette, Ind.; also in the manufacturing of W. Ross & Co., and Warder, Bushnell & Co., of Springfield, Ohio.

The Stine Smith Machine Company, of Osceola, Clearfield County, Pa., capital \$50,000, are a recent incorporation.

The Little Giant Gas Engine Company have been organized at Chicago; capital stock, \$100,000.

J. S. Glenn, proprietor of the Glenn Valve Manufacturing, 115 Fremont street, Chicago, is furnishing the hydraulic valves for controlling machinery in the Columbia Iron and Steel Company's Works, at Pittsburgh, Pa., through Kelly & Jones Company, Pittsburgh, Pa.

C. & G. Cooper, Mount Vernon, Ohio, builders of traction, stationary and portable engines and sawmill machinery, report an active business. They have been established since 1834, and employ 165 men.

Neale & Levy, of Philadelphia, have 350 hands at work in the various departments in their yard. They have taken a contract for the construction of a freight and passenger steamer for Menendez & Co., of Havana, to ply on the Gulf coast. The new vessel will be 245 feet long, 35 feet breadth of beam and 21 feet depth of hold. Her engines will be of the compound type, with cylinders 30 inches in diameter for high pressure and 50 inches for low pressure, with 3 feet stroke. Steam will be supplied by two Scotch boilers, 12 feet in diameter and 11 feet in length, which will carry a working pressure of 100 pounds of steam. The vessel will be provided with accommodations for 40 first-class passengers, and all the joiner-work will be of the best. She is to be completed by May 1. The firm are also building an iron tugboat for service on the Delaware River. She is 90 feet long, 19 feet beam and 9½ feet depth of hold. She will be supplied with a compound engine, 15 inches and 26 inches, with 22-inch stroke.

James W. Hotchkiss, 93 John street, New York, recently shipped three of his well-known mechanical boiler cleaners to Singapore, India, to Kimching & Co., owners of large rice mills. They were shipped by the steamship Devonshire, weight 1000 pounds, at a cost of only \$10, delivered in Singapore.

Judge Cox, of the United States Circuit Court, rendered a decision on Saturday, the 18th inst., in the equity action of Richard Dudgeon, of New York, against Thomas H. Watson and Francis H. Stillman for the infringement of two patents owned by complainant, both for improvements in hydraulic jacks. The defense was want of novelty and non-infringement. Judge Cox in his opinion described at length the workings of hydraulic jacks, and says there is no doubt as to the infringement of the patent, as the jack made by defendant works in substantially the same manner as plaintiff's. He decided that plaintiff is entitled to an injunction and an accounting.

A new industry is about to be established in Fitchburg, Mass., by the recently organized Fitchburg Mfg. Company. The company's specialties will be steam engines, small electric-light plants, &c.

**Hardware.**

The Hartman Steel Company, Limited, of Beaver Falls, Pa., are filling an order for extra sized mats to be used in the penitentiary at Joliet, Ill. Some of the mats are of enormous size.

At the Pittsburgh Hinge and Chain Works, Beaver Falls, Pa., the employees are working overtime to finish up orders before the first of January, preparatory to merging that works into that of the Baker Wagon Company, of Westville, Ohio, under the name and title of the Baker Wagon Iron Company, of Beaver Falls.

The Wheeling Hinge Company, of Wheeling, W. Va., manufacturers of wroughtiron and steel goods, report business very satisfactory. Their works are running full in



all departments, with sufficient orders on hand to insure a bright outlook for the coming year.

The contract for furnishing new scales, beams, weights and other weighing apparatus for the customs service during the present fiscal year has been awarded to Riehl Brothers, of Philadelphia.

It is reported that H. C. Williams & Co. have bought out the business of the Taylor Mfg. Company, at New Britain, Conn., and will continue the manufacture of light hardware specialties and will also push the making of electric goods.

It is said that the officers of the Cuyahoga Falls Rivet Company, of Cuyahoga Falls, Ohio, contemplate the removal of their works to Akron, Ohio. The matter will be definitely decided on after the company's annual meeting, which will be held in January.

The Hartford Machine Screw Company, Hartford, Conn., advise us that their 500 Screw machines are working up to their full capacity, turning out all classes of Milled Machine Screws and other fancy turned work, from the largest parts used in the construction of millwork to the smallest Screws which enter into the manufacture of watches, of all materials, including steel, iron, brass, German silver, &c. They are making a specialty of both Flat and Knurled Head Thumb Screws, Taper Pins, Steel and Iron Collar Screws, Studs, &c.

The Waltham Watch Tool Company, Waltham, Mass., are the successors of the Hopkins Watch Tool Company, and are now manufacturing the full line of Watch Tools formerly made by them, and have made some additions thereto, including some desirable new combinations, which are set forth in their supplementary price list. They are also about to put on the market a new cheap Watchmaker's Lathe.

The Putnam Cutlery Corporation, Putnam, Conn., recently began operations and are making a specialty in Cutlery called the "Old Put" Knife. This Knife is described as made extra strong by means of a support where the shank of the blade enters the handle. This device is the invention of A. E. Johnson, general manager of the company, and is designed especially for leather cutting Knives.

#### Miscellaneous.

A company represented by Mr. E. D. Dithridge, of the Martin's Ferry, Ohio, Glass Works, have purchased the old car works in New Brighton, Pa., and if the Board of Trade will give them \$6000, to be paid after they have the establishment in full operation, their building will be repaired at once and another industry located in New Brighton.

The Shaner Gas Coal Company have been organized, with a capital of \$250,000, and will open works at Shaner Station, near Pittsburgh, on the Baltimore and Ohio Railroad, as soon as a charter has been secured.

An order has been received at the car shops of the Philadelphia and Reading Railroad, at Reading, Pa., for the building of 200 eight-wheel standard coal cars. The wages of the carpenters in these shops have also been materially advanced.

A correction in the table showing the shipments of iron ore from this port brings the total for the season up to 853,396 gross tons. The revised statement of shipments is given below:

MARQUETTE DISTRICT.	
Jackson	5,465
Manganese (G. L. B.)	1,367
Rolling Mill	3,213
Milwaukee	35,417
Cambria	12,214
Cleveland	89,790
Lake Superior	70,321
Barnum	3,334
Salsbury	1,028
Detroit	30,137
Pittsburgh and Lake Erie	58,006
Winthrop	94,581
Humboldt	20,207
West Republic	10,559
Republic	84,162
Champion	123,108
Beaufort	17,334
Titan	13,170
Webster	6,035
Wetmore	2,408
Buffalo	10,626
Marquette Ore Company	1,195
Argyle	1,135
Sam Mitchell	5,252
Jim Fawcett	10,072
Matt Gibson	12,142
Michigan	46,250
Total	853,396

This makes the total lake shipments for the season 3,494,186 gross tons, the increase over the shipments in 1885 being 1,065,700 tons.—*Marquette (Mich.) Mining Journal.*

The plans for the new glass works being established by the citizens at Beaver Falls, Pa., is being prepared, and it is expected that work on the buildings will be commenced in January.

The Aurora iron mine, on Gogebic range, a Milwaukee dispatch says, has been sold to Chicago, Cleveland and Eastern parties for \$500,000.

The miners employed in the Steubenville Mining Company's works, at Steubenville, Ohio, made a demand last week for an advance of 2 cents per car for mining. The miners say if the company do not accede to their demands they will quit work.

All the leading coal mines in the vicinity of Youngstown, Ohio, are idle, with little prospect of a settlement, the men coming out because of the operators refusing to concede an advance of 10 cents per ton and in accordance with the decision of the miners' convention which met in Youngstown on the 8th inst. Several small country banks employing only a few men are still running.

After the completion of its organization the Executive Board of the Western Window Glass Syndicate, at a meeting held in Pittsburgh on the 15th inst., ordered an advance of 10 per cent. in the price, making the discount on the price list 65 and 5 per cent. This is the lowest price at which the manufacturers claim they can make a profit, and say they are tired of giving away their glass in competition. If the Eastern manu-

facturers cut these prices in the Western markets the syndicate promises to carry the war into the enemy's country and kill his trade. The syndicate is now complete, all but two Western firms having joined it and paid their forfeits. These two are the Findlay Window Glass Company, of Findlay, Ohio, and Forbes Holton, of New Castle, Pa. As the latter has orders enough booked to run his factory till next May, and the Findlay Company is a co-operative concern only just started, the syndicate fears nothing from their competition. The amount deposited in forfeits is \$48,000, representing 480 pots at a forfeit of \$100 each.

The first natural gas brought to Youngstown, Ohio, was turned on in the works of the Mahoning Valley Iron Company, at that place, on the 13th inst. The fuel will be adopted by the other manufacturers there as soon as a supply can be obtained.

It is reported that the Rogers Silver Plate Company, of Meriden, Conn., have been induced to remove their business of manufacturing plated ware to Danbury. The change is to be made immediately, and it is anticipated that the work of manufacturing will begin about January 1.

A company has just been formed at Hartford, Conn., under the name of the Johns-Pratt Company, for the manufacture of vulcanized asbestos packing of all kinds. The president of this company is H. W. Johns, the widely known asbestos roofing manufacturer of New York; the secretary and treasurer is R. N. Pratt, president of the Pratt & Cady Company, of Hartford; the others interested are, with scarcely an exception, men who have for some time been closely identified with the manufacture of asbestos products. A brick building has been erected near the works of the Pratt & Cady Company, and operations will be shortly commenced.

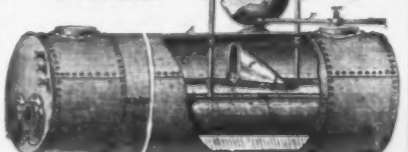
The Wason Mfg. Company, of Springfield, Mass., have received a contract from the Boston and Maine Railroad for the erection of 15 first-class passenger coaches.

The Phoenix Iron Company have just closed a contract to furnish all the steel shapes to be used in the construction of the Government cruisers which are to be built at Cramp's shipyard, in Philadelphia. These include deck beams, bulbs, angles, tees, channels and a variety of shapes which have as yet never been made in the United States. This is regarded as a most important contract, and shows that not only can the ships be built here, but the material of every description can be furnished from Pennsylvania mills.

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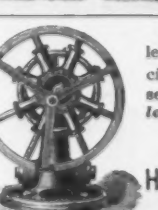
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By this arrangement the fil-  
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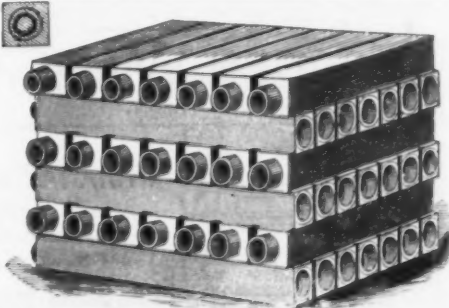


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operation, showing the  
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These Filters have  
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CHAIN PUMP TUBING.

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Will hold 200 pounds.

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Bright Wire Goods. Tassels, Picture and Bangle Hooks, and Specialties in Wire. Wire Nails of all kinds and sizes.

The Growth of the Southern Iron  
Trade.

From an interesting interview with Gen.  
Willard Warner, of the Tecumseh Iron  
Company, Tecumseh, Ala., A. M. Shook, of  
Troy City, Tenn., manager of the Tennessee  
Coal, Iron and Railroad Company and Prof.  
J. B. Killebrew, secretary of the Alabama  
and Tennessee Coal and Iron Company,  
printed in the *Tribune*, we take the follow-  
ing, which puts in a compact form informa-  
tion which has been printed at different  
times in our columns:

There are three great centers of coal and  
iron production in the States of Alabama,  
Tennessee and Georgia—Birmingham, Ala.,  
Chattanooga, Tenn., and Sheffield, Ala. The  
large charcoal iron producing regions of  
West Tennessee and on the line of the Selma  
Division of the East Tennessee, Virginia  
and Georgia Railroad, in Alabama, are sub-  
divisions of the main districts. The great  
Clinton vein of red hematite or fossiliferous  
ore belonging geologically to the upper  
silurian period, beginning in the State of  
New York, extends with great persistency  
to Birmingham, Ala., there attaining its  
greatest thickness of 26 feet. It is 6 feet  
thick at Rising Fawn, Ga. The brown  
hematite ores from which all the charcoal  
iron of these States is now made, and  
which is also largely used by the coke fur-  
naces for mixture with the red hematite  
ores, are at present most largely developed  
in Alabama along and contiguous to the  
Selma Division of the East Tennessee, Vir-  
ginia and Georgia Railroad and in Hickman  
and Wayne Counties, Tenn., while great  
deposits, as yet untouched, are found in  
Franklin County, Ala., on the line of the  
Sheffield and Birmingham Railroad, now  
being rapidly built by Messrs. Ensley,  
Parish, Shook and their associates, and else-  
where in Alabama and Tennessee. These  
ores, when cleanly mined, will yield raw—  
that is, without roasting to expel the mois-  
ture—from 45 to 50 per cent. of iron, and  
calined from 50 to 55 per cent. The red  
ores are all worked raw and yield from 40  
to 45 per cent. of iron.

The coal supply of these districts is inex-  
haustible, and covers an area of 5000 square  
miles in Tennessee, with from one to three  
workable seams, the best coking seam being  
the Sewanee, which is 500 square miles in  
extent. In Alabama it covers an area of  
6000 square miles, embracing the Warrior,  
Cahawba and Coosa fields, with three or four  
workable seams, each from 4 to 7 feet in  
thickness, and mostly coking coal. Of these  
the Pratt seam has hitherto furnished by  
far the greatest amount of coal, but the  
good coking qualities of the other veins have  
been proven. The production of the Pratt  
Mine is now 2500 tons a day, and of the  
Sewanee 1500 tons. Each of the subdivi-  
sions of this great coal and iron field has its  
ore and coal in close proximity, and lime-  
stone for furnace purposes is also found in  
great abundance near the ore. The new city  
of Sheffield is built on a limestone bluff  
on the Tennessee River from 80 to 100 feet  
high. Two railroads, the Georgia Pacific  
and the Memphis and Birmingham, cut  
through the great Warrior coal field from  
east to west; and the Sheffield and Birming-  
ham and the Louisville and Nashville  
from north to south. The Cahawba field  
is reached by the East Tennessee,  
Virginia and Georgia and by the New-  
Orleans, Texas and Pacific, and the Coosa  
field by the East and West Railroad of Ala-  
bama. The new city of Sheffield is most  
favorably situated. Besides its assured  
railroad connections south, north, east and  
west, it stands on the bank of the Tennes-  
see River below the Muscle Shoals. The  
river is navigable to this point at all seasons  
of the year. In the Birmingham district  
there are 21 large coke furnaces in opera-  
tion or building, with an estimated capacity  
for 1888 of 750,000 gross tons of iron. The  
Chattanooga district has 15 coke and 13  
charcoal furnaces, with a capacity for 1888  
of 420,000 tons of coke iron and 100,000  
tons of charcoal iron. The Sheffield dis-  
trict has five large coke furnaces now build-  
ing, with a capacity for 1888 of 200,000 tons  
of coke iron, and four charcoal furnaces  
that will produce annually 45,000 tons of  
iron. The total estimated product of iron  
in the three States of Alabama, Tennessee  
and Georgia for 1888 will be 1,515,000 gross  
tons, of which Alabama will produce 1,040,-  
000 tons, Tennessee 425,000 and Georgia  
50,000 tons. All the coke furnaces except  
one are supplied with brick stoves and are  
of the best modern type.

The pioneer in the manufacture of coke  
iron in the South was Gen. J. W. Wilder, of  
Chattanooga, formerly of Indiana, who built  
the first coke furnace at Rockwood, Tenn.,  
in 1867, and the second in 1872, for the  
Roane Iron Company. These furnaces have  
been successfully and profitably run ever  
since, the Roane Iron Company paying regu-  
lar 6 per cent dividends on a capital of \$1,-  
000,000. The most important single factor  
in the iron trade of this section is the  
Tennessee Coal, Iron and Railroad Com-  
pany, which lately absorbed the Pratt Coal  
and Iron Company, of Birmingham, Ala.  
The capital of this company is \$10,000,000,  
and they now have in operation five large  
furnaces—two at Birmingham, Ala., two at  
South Pittsburgh, and one at Cowan, Tenn.  
—and are building four large new furnaces  
at Ensley City, near Birmingham, and one  
at South Pittsburgh. They own 300,000  
acres of ore and coal lands in Alabama and  
Tennessee, including the famous Pratt and  
Sewanee seams. This company in 1888  
will make 1200 tons of pig iron a day. Enoch  
Ensley is president, T. T. Hillman vice-  
president and Mr. Shook is the general  
manager. The Alabama and Tennessee Coal  
and Iron Company, of which A. S. Colyar,  
of Nashville, is president, and Mr. Warner  
vice-president, own 70,000 acres of valuable  
coal and iron lands in Alabama, and have  
contracted for three coke furnaces at Shef-  
field, with a daily capacity for each of 125  
tons. Messrs. Ensley, Parish, Shook and  
their associates are also building one large  
furnace at Sheffield, and the Sheffield Com-  
pany the fifth. The South Pittsburgh Coal  
and Iron Company are also preparing to build  
two large coke furnaces at South Pittsburgh,  
with a daily capacity of 120 tons each.  
A. G. West and his associates, of Hartford,  
Conn., bought the Shelby Furnace, in Ala-

bama, in 1867 or 1868, and modernized it;  
and their successors, with Walter Crafts, of  
Massachusetts, as general manager, built a  
second furnace in 1873. This furnace is 14  
feet by 60 feet, and is the largest charcoal  
furnace in the world, the second largest  
being the Tecumseh Furnace, which is 12  
feet by 60 feet. The Rising Fawn Furnace  
was built in 1875 by Messrs. Jarvis, Dittus  
and Wright, who lost a large amount of  
money in the enterprise. The property passed  
into the hands of Senator Joseph E. Brown, of  
Georgia, W. C. Morrill, of Atlanta, and Mr.  
Sovier, of Boston, who have operated it with  
great success. A strong English company  
bought some 140,000 acres of coal and iron  
lands in Tennessee and built the two fur-  
naces at South Pittsburgh. This company  
also had bad fortune and sold out to the  
Tennessee Coal, Iron and Railroad Company  
in 1882, who are now successfully operating  
the furnaces. This latter company were organ-  
ized in 1866 and built the Cowan Furnace,  
which has been a success; this year they have  
amalgamated with the Pratt Coal and Iron  
Company. In 1885 Sir Titus Salt and his  
English associates completed two large fur-  
naces at Dayton, Tenn., on the line of the  
Cincinnati Southern Railroad, and are now  
running one of them. The first furnace  
was built at Birmingham by T. T. Hillman in  
1879-80. I saw the site of Birmingham in  
1870 as a cotton field, and could have  
bought the land for \$10 an acre. Now the  
city has a population of 35,000, and lots are  
selling for \$1000 a front foot. Col. J. W.  
Sloss built two large furnaces at Birming-  
ham in 1881-82, Messrs. De Bardeleben and  
Underwood built the Mary Pratt Furnace in  
1882, and the Messrs. Woodward the Wheel-  
ing Furnace, near Birmingham, in 1881-82.  
The Eureka Company, of which J. D. Farris,  
of Cincinnati, is president, built the two fur-  
naces at Oxmoor, 6 miles from Birming-  
ham, in 1876-77.

Citico Furnace, Chattanooga, was built by  
the Citico Furnace Company, H. S. Cham-  
berlain, president, in 1874. This furnace  
and the two Rockwood furnaces are now  
making Bessemer pig iron from the Cran-  
berry ore on the line of the East Tennessee,  
Virginia and Georgia Railroad. This iron  
will be used by the Roane Iron Company at  
their mill in Chattanooga for making Besse-  
mer steel rails, beginning in February. This  
will be the inception of the manufacture of  
steel rails in the South. Capt. H. S. Cham-  
berlain is also president of this company.  
There are now building in this region 18  
new furnaces of large size and best modern  
type, as follows: Nine at or near Birming-  
ham, five at Sheffield, three at South Pitts-  
burgh and one at Chattanooga. In 1888  
there will be 41 coke and 17 charcoal fur-  
naces in the region, not counting some small  
charcoal furnaces which may be regarded  
as abandoned, with a total assured produc-  
tion, as I have already told you, of 1,500,000  
gross tons. The prominent and most active  
man in this rapid development of the coal  
and iron industry of the South are Enoch  
Ensley, T. T. Hillman, J. W. Sloss, H. F.  
De Bardeleben, Samuel Noble and Willard  
Warner, of Alabama; J. C. Warner, A. S.  
Colyar, E. W. Cole, H. S. Chamberlain and  
A. M. Shook, of Tennessee, and Senator  
Brown and W. C. Morrill, of Georgia. John  
Inman, of this city, has also been active in  
developing this region since 1882. He has  
this year invested more than \$1,000,000 in  
iron and coal properties there. Samuel  
Thomas, the great ironmaster of Pennsylv-  
ania and president of the Thomas Iron  
Company, has large iron and coal properties  
near Birmingham, and he is now preparing  
to build one, and probably two, large fur-  
naces there.

Imports of Iron Ore at Baltimore.

According to the *Baltimore Journal* the  
foreign imports of iron ore at Baltimore  
since January 1 amount to 332,054 tons,  
against 70,220 tons for the same time last  
year. Of iron and steel generally the im-  
ports this year have been very heavy,  
54,672 tons of pig iron having been re-  
ceived this year, against 4110 tons last  
year. The imports of the leading articles  
of iron and steel at Baltimore since Janu-  
ary 1, compared with the same time last  
year, have been:

	This year.	Last year.
Pig iron, tons.....	54,672	4,110
Ord. tons.....	332,054	70,220
Rails, steel, tons.....	3,024	...
Rails, steel, pieces.....	10,739	...
Rails, pieces.....	30,436	...
Blooms, steel, tons.....	1,420	...
Wire, bundles.....	42,283	...
Steel rods, bundles.....	18,410	...

In addition to these there were consider-  
able imports of bar iron, wire rods, &c.  
The indications now point to large receipts  
of foreign ore, iron and steel during the  
coming year, and large quantities are even  
now on the way. The imports of iron ore  
at all the Atlantic ports this year will  
probably be much the largest on record,  
falling not far below 1,000,000 tons, the  
bulk of which has been received at Balti-  
more and Philadelphia, the latter port re-  
ceiving the largest amount.

The dawn of a better day as respects rail  
practice is indicated by the fact that the  
Bethlehem mills are just completing an order  
of between 1500 and 2000 tons of rails of 90  
pounds per yard section for the Philadelphia  
and Reading. To that complexion we must  
come at last on lines of heavy traffic, and  
the sooner it is done the better it will be for  
the stockholder, provided always proper care  
be taken to get good quality, without doing  
which mere weight of section will be of little  
advantage. We may add to the above, which  
we quote from the *Railroad Gazette*, that to  
our knowledge a leading rail maker has had  
an inquiry from a Western railroad for a  
large block of 100-pound rails.

The Western Iron Ore Association, com-  
posed of ore producers west of the Allegha-  
nies, met at Cleveland in annual session and  
elected George H. Ely president and W. D.  
Rees secretary. The Executive Committee  
consists of George A. Ely, representing the  
Marquette district; S. L. Mather, Fayette  
Brown and W. D. Rees, the Menominee dis-  
trict; James Pickands and H. A. Tuttle, the  
Gogebic district, and E. A. Hitchcock, of  
St. Louis, the Missouri district.

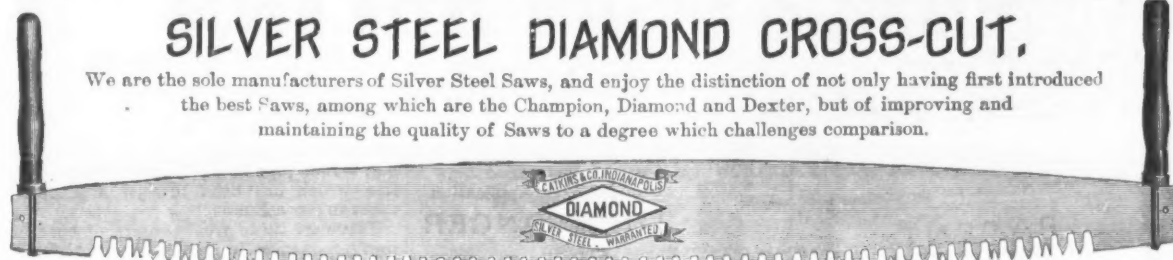




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Ground substantially uniform gauge on the toothed edge, and any gauge required on the back.

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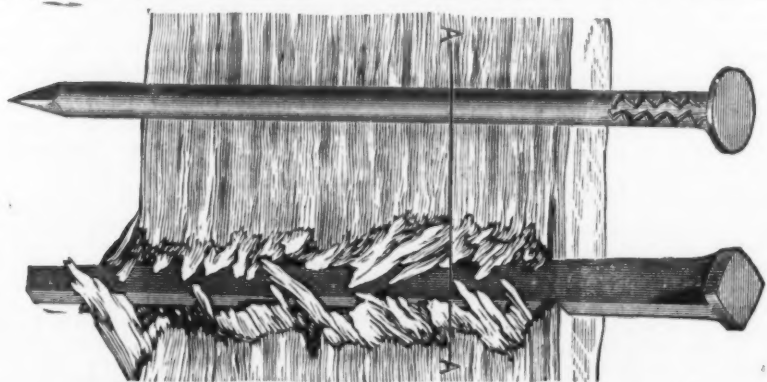
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No. 615 COMMERCE ST.  
PHILADELPHIA, Pa.  
**SHELF BOXES**  
MADE OF WOOD WITHOUT NAILS OR SCREWS.  
SEND FOR CATALOGUE.  
PAPER BOXES ALL KINDS FOR HARDWARE.

**BIRMINGHAM PLANE MFG. CO.,**

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SOLID BOLSTER AND FLUTED HANDLES.

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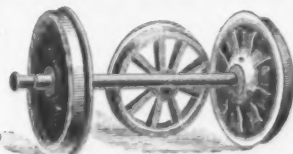
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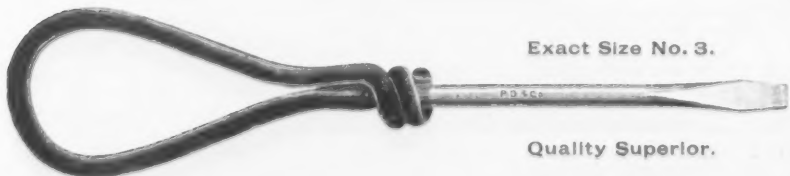
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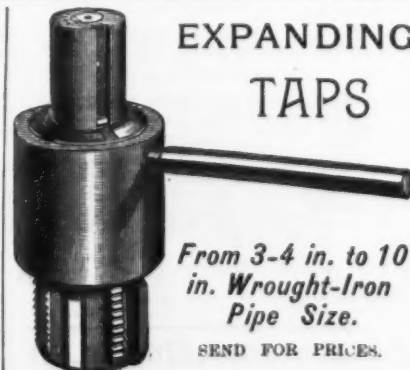
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This Hammer possesses advantages superior to any other in the market. It has neither cylinders, valves nor piston, and is not subject to the wear and tear of these parts. It has a space, less power to drive, and is much lighter and truer than other hammers with double the weight of ram.

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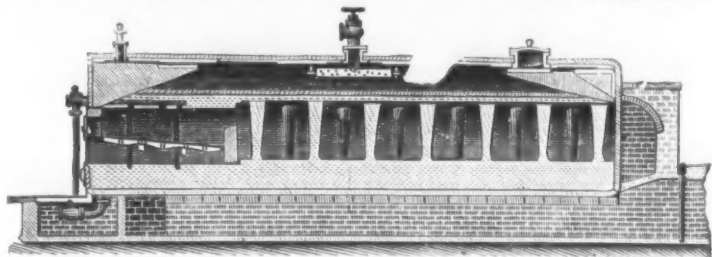


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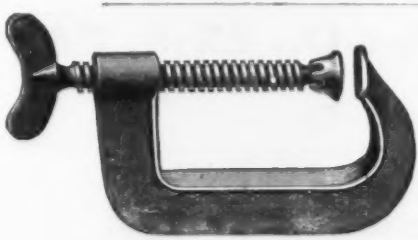
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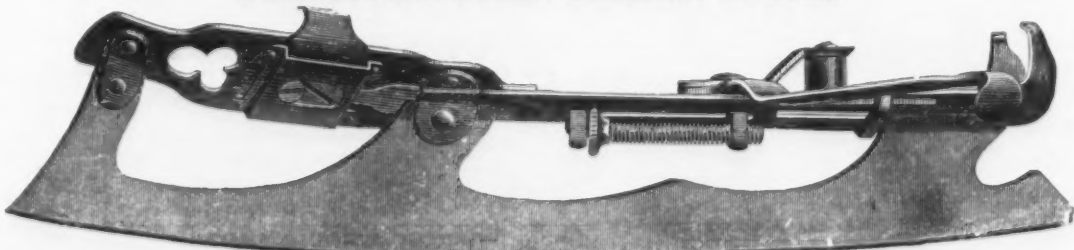
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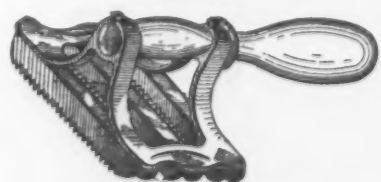
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New York Office, 95 Chambers Street, in charge of TOWER & LYON.

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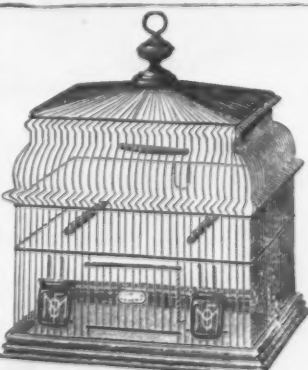
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twenty years ago, have not in a single instance given  
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it was properly hung, has it failed to give entire satis-  
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May be applied to any door  
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When the door is opened or the  
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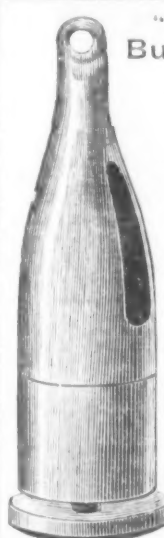
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are prepared to quote lower  
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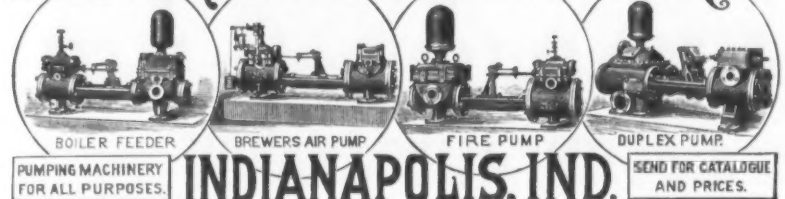
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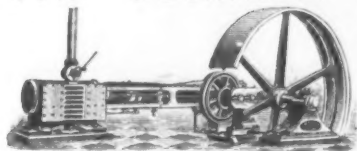
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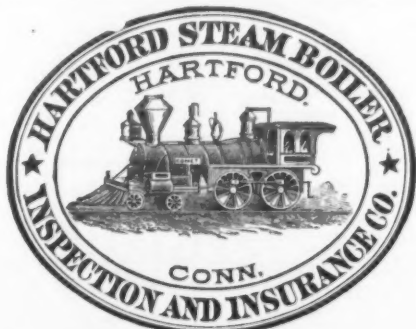


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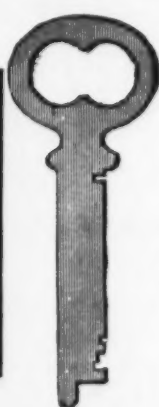
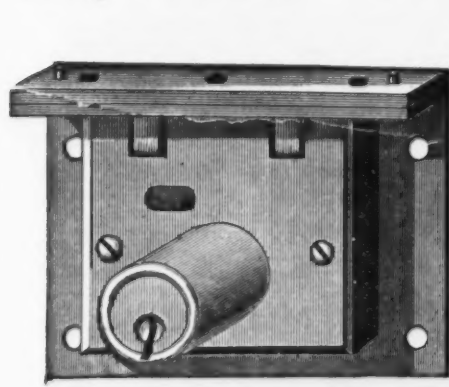
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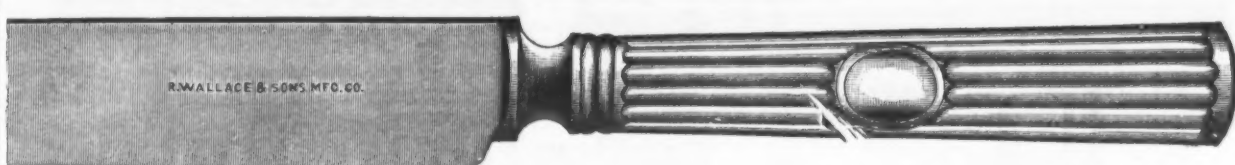
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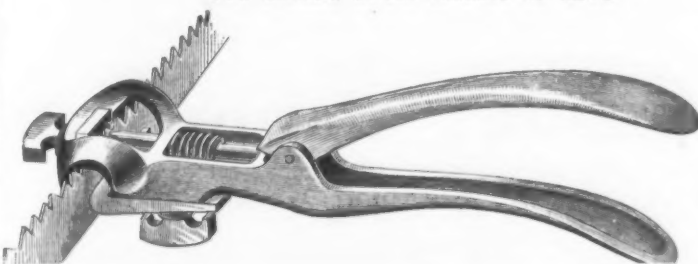


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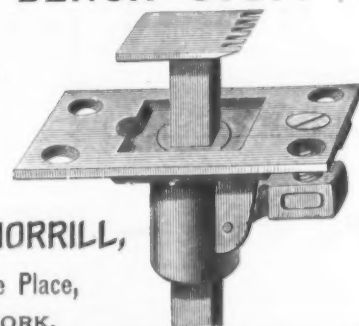
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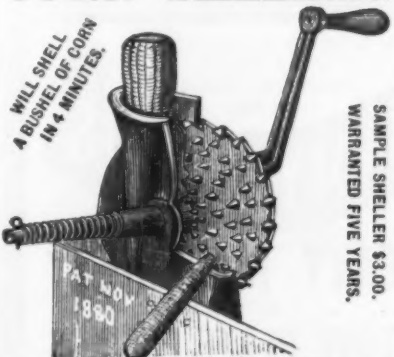


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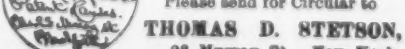
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Remember that we are the  
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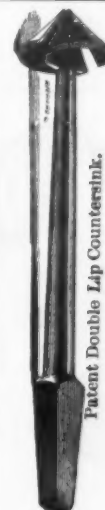
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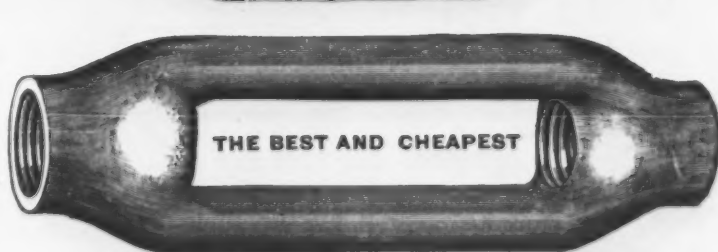
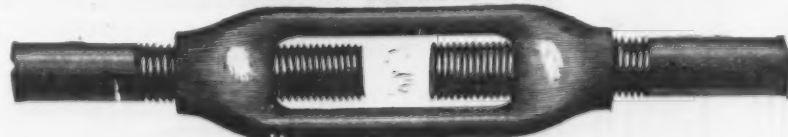
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ordered. Some few have not yet worked up to them. If you happen to deal with one of  
these last, write us for Circular.

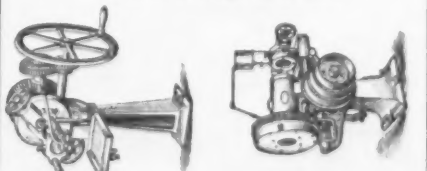


## "Eclipse" Pipe-Cutting Machines.

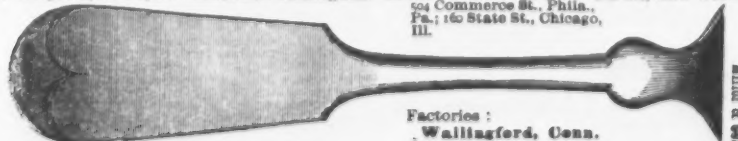
DID IT EVER OCCUR TO YOU?

That a Pipe-Cutting Machine in your Factory or Mill would  
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Machine. The "Eclipse" Machine is now built in six different  
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No. 5 " 2 1/2 to 6 in. No. 6 " 1 to 4 in.  
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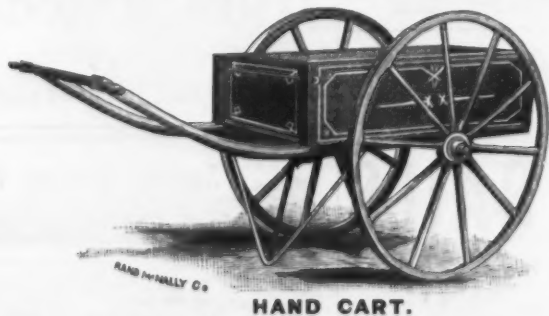
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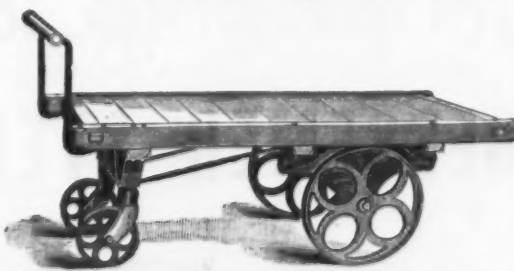
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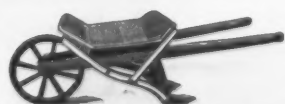
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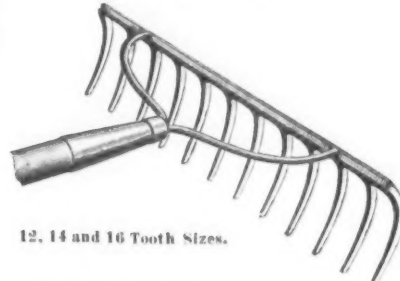
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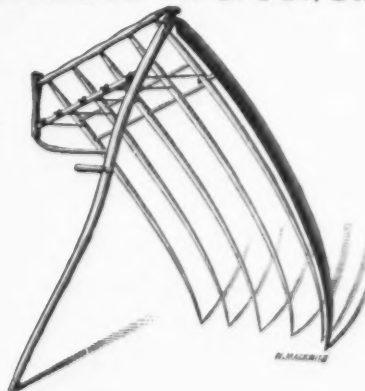
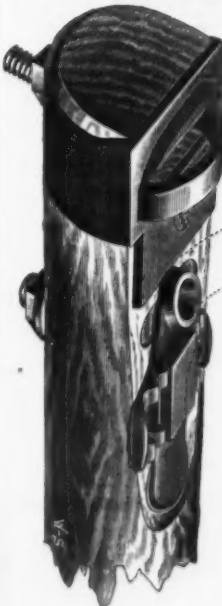
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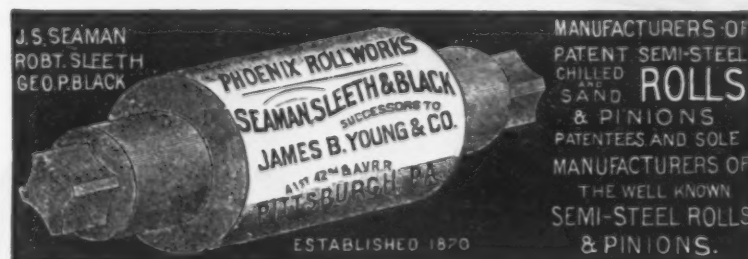
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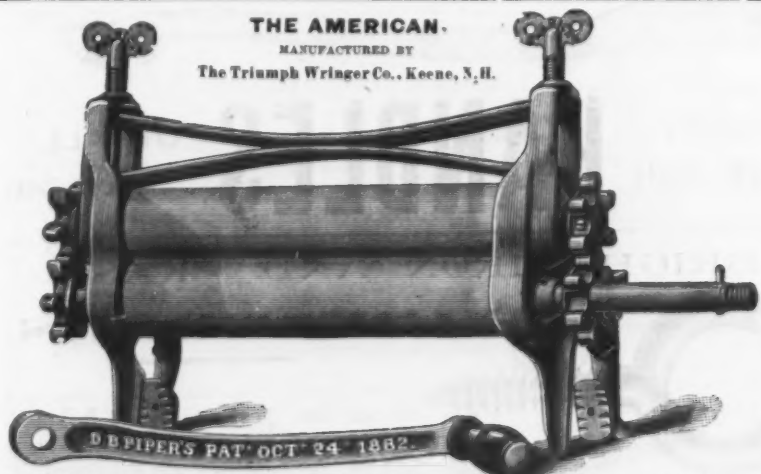
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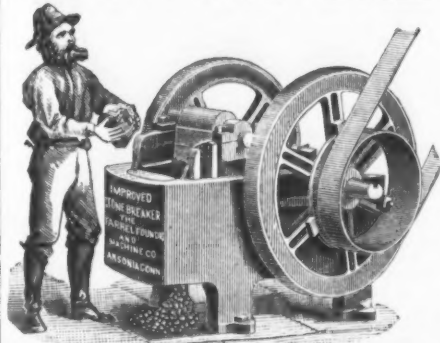
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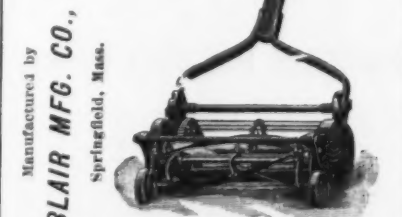
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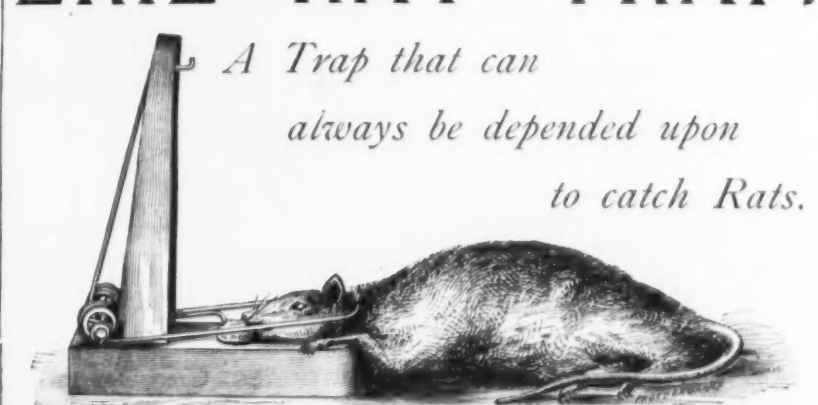
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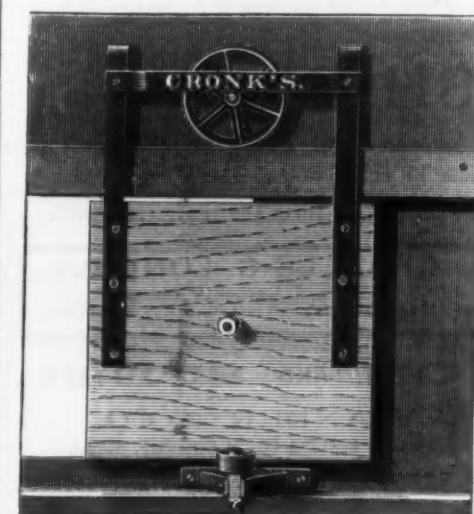
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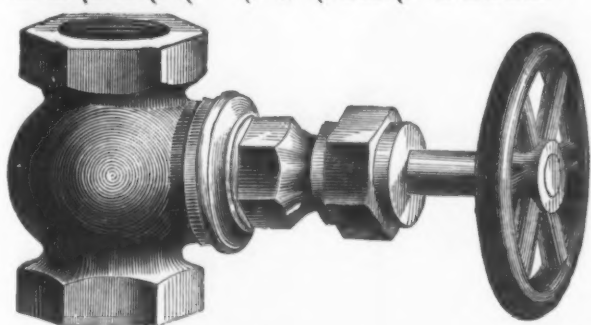
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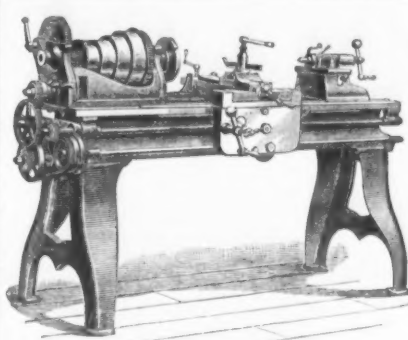
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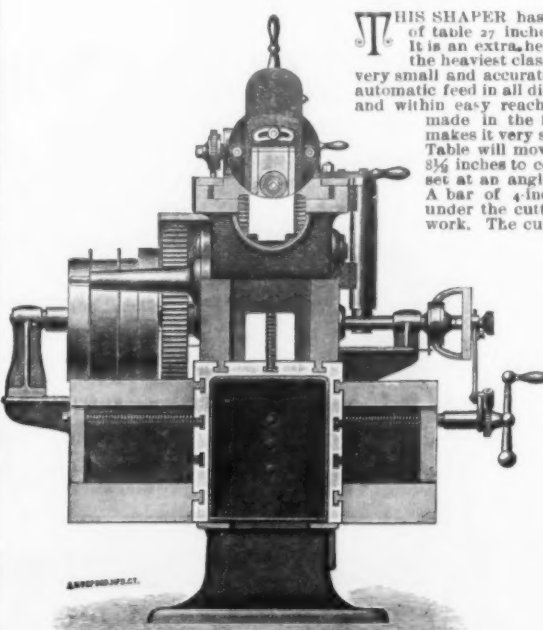
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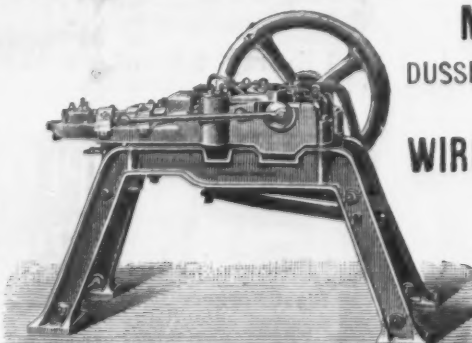


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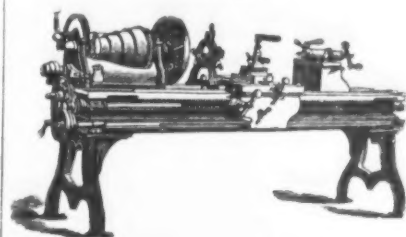
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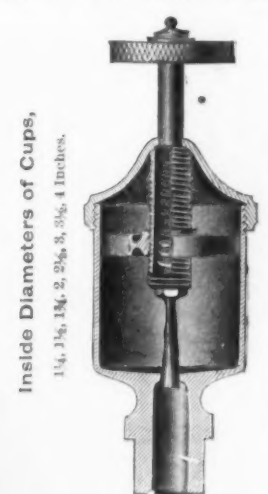
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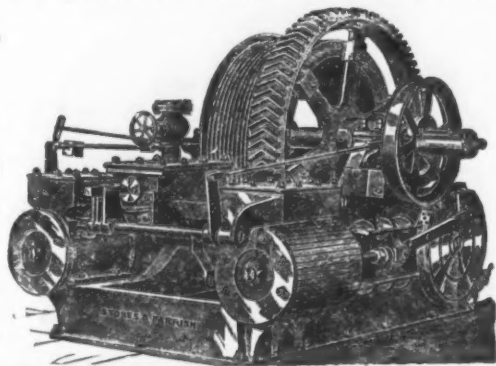
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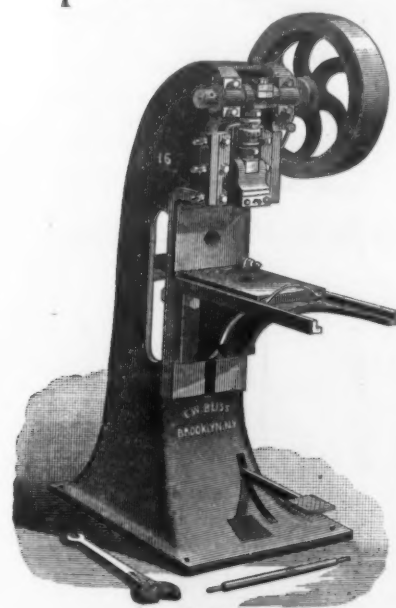
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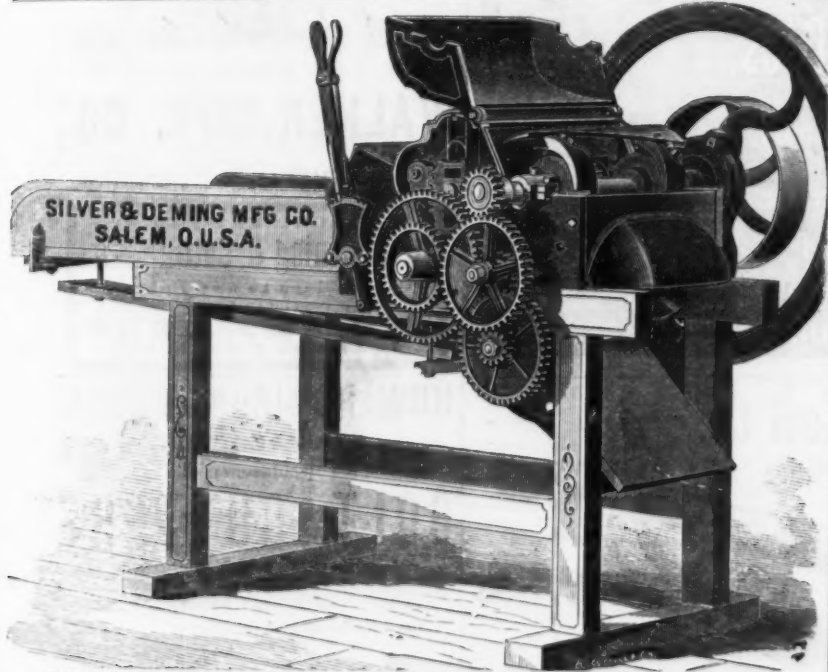


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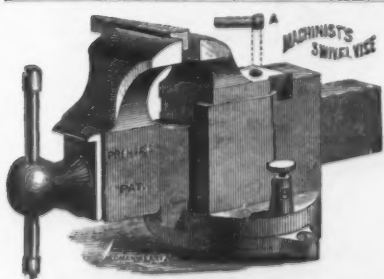


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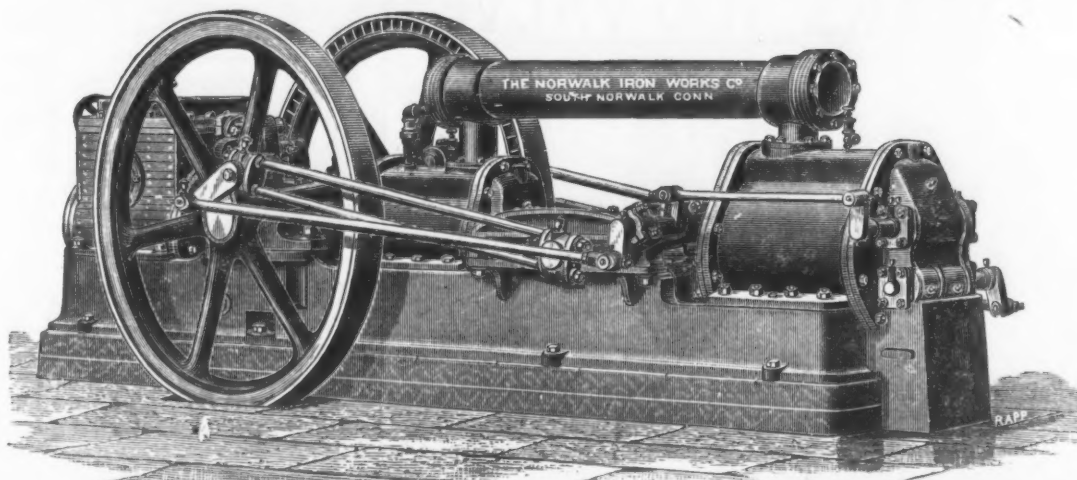
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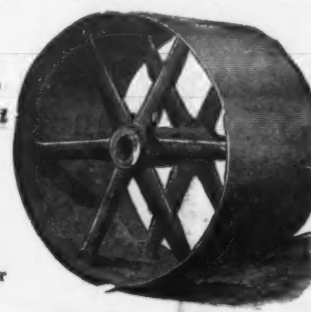
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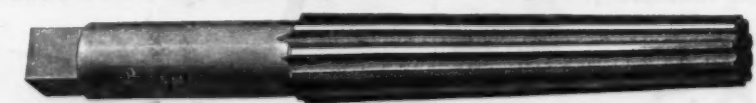
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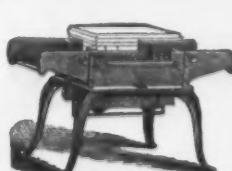
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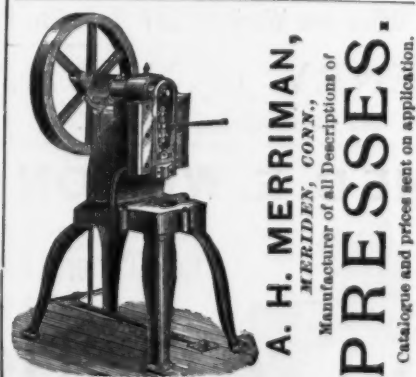
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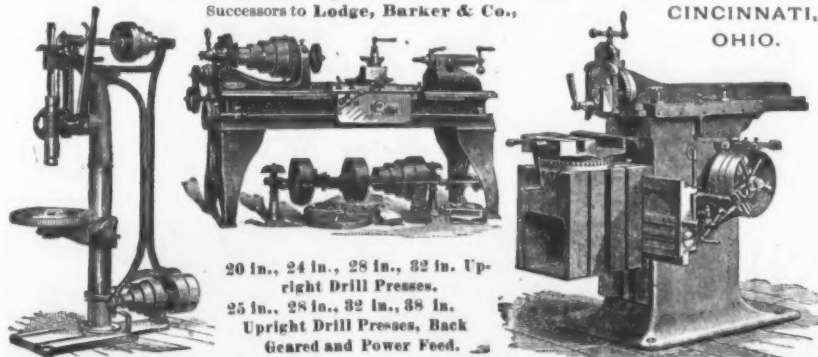
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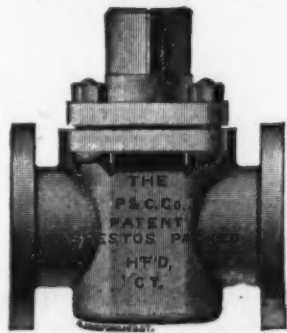
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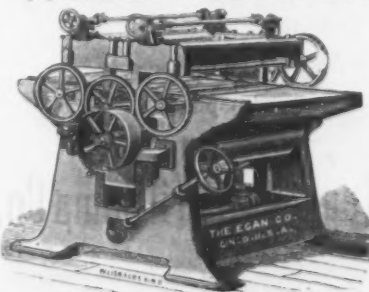
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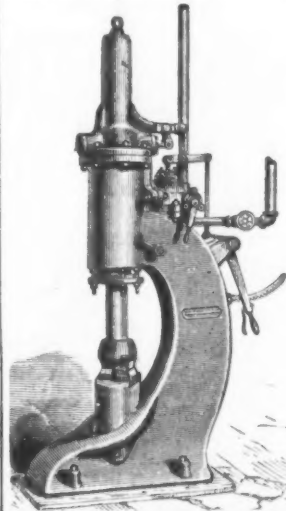
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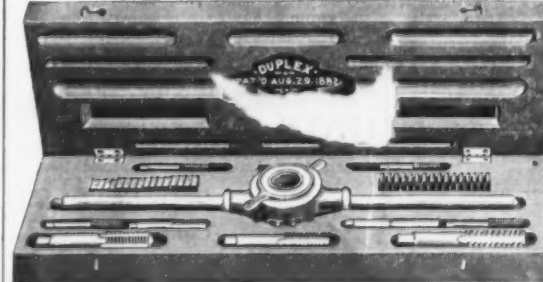
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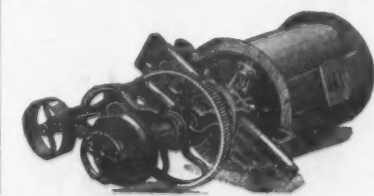
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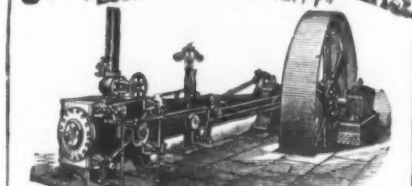
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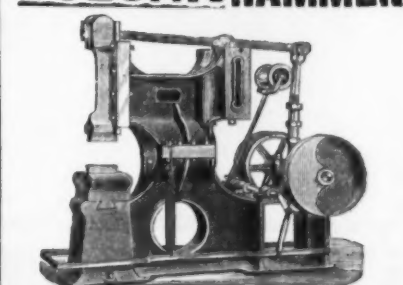
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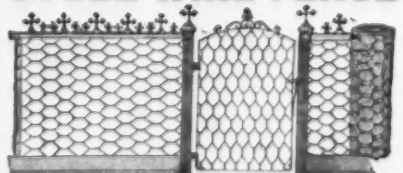
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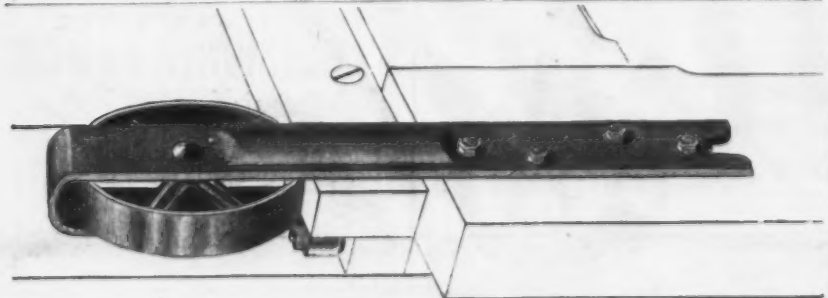
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